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ABSTRACT

This study investigated the language performance of two groups of children in grades four, five, seven, and eight. One group was composed of 15 children who began first grade at less than six years, three months of age; the other group included 15 who began first grade after they were over six years, eleven months of age. Results from a series of measures of reading achievement, speech, and language production indicated that the late-entry students consistently performed more successfully than did the early-entry students. This was interpreted as indicating that the early introduction of formal language activities, out of maturational or developmental sequences, does not promote maturation. (Author/AA)

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ABSTRACT

A STUDY OF SOME SPEECH-LANGUAGE FUNCTIONS OF CHILDREN AFFECTED BY EARLY SCHOOLING

By

Robert Guy Hyder

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B. A. Southern Missionary College, 1949
M. A. California State University at Los Angeles, 1966

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A Dissertation Submitted in Partial Fulfillment of
The Requirements for the Degree of
Doctor of Philosophy

Walden University
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ABSTRACT

The specific purpose of the investigation was to test the null hypothesis that no significant difference will be found in measures of language performance obtained from two groups of children in grades four, five, seven, and eight which are differentiated on the basis of entry age to first grade. Two groups of children, one composed of fifteen who began first grade experience at less than six years, three months of age (Early Entrants, E-E) and a second composed of fifteen who began first grade after they were over six years, eleven months of age (Late Entrants, L-E), were employed to test the basic concept. The groups were compared in the following criterion variables:

Language components of California Short Form Test of Academic Aptitude.

Gilmore Oral Reading Test.

Templin-Darley Screening Articulation Test--consonant articulation.

Ratings of inflection and vowel production.

Picture Story Language Test.

The hypotheses regarding results obtained on the variables were tested by use of analyses of variance designs.

Summary of results

Results obtained in analyses of data indicated L-E group was consistently higher than E-E group. Thirteen of 32 null hypotheses were

rejected at .05 significance level. These results were interpreted as supporting the basic hypothesis of the research.

Conclusions

For conditions under which subjects in this investigation are studied, the results are interpreted as supporting the basic premises of the following conclusions:

That early introduction of formal language skills-activities out of maturational developmental sequence do not promote maturation.

That any gains of the E-E group represent short-term value.

That a distinction is seen between competence items closely keyed to developmental maturation and linguistic performance items in elementary grammer school children.

That previous investigations which question the value of early education are supported.

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DEDICATION

To Judith, my sweetheart, my best friend, and
my wife. Without her patience,
love and constructive
criticism this project never
could have been completed.

And...
to our daughter, Linda Colleen, who from her
childhood upward 'thru' college days
has been a source of
inspiration and strength
to our lives.

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R.G.H.

CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS USED

Current theory supports the concept that developmental steps follow in an orderly maturationally-related sequence (Baker, 1971, pp. 15-25; Burroughs, 1972, pp. 20-35; McDaniel, 1967, pp. 29-32). Efforts to promote mastery of one or more steps may result in premature achievement of a behavior, but they do not provide the basis for the development of subsequent or related behavior (Ilika, 1963, pp. 85-124; Gott, 1963, pp. 29-43, 99-106; King, 1955, pp. 331-36; Keister, 1941, pp. 587-96; Carroll, 1964, p. 290; Halliwell, 1964, p. 658).

The child's experiences may not follow or be in harmony with the (innate) natural sequential patterns. For example, it is well established that the child who does not progress through the turning, creeping, crawling, and walking sequences will demonstrate disturbance in gross and fine motor coordination and skills in reading (Boney, 1944, pp. 211-14; Heffernan, 1968, pp. 494, 496-97).

Because of the traditional pattern of children entering kindergarten in September during the calendar year of their fifth birthday, or entering first grade in September during the calendar year of their sixth birthday, there may be a variation of nine to fifteen months in age of school entry. Greater discrepancies in age of school entry have resulted in recent years by bewildered parents accepting the notion of "the earlier. . .the better" to be certain that their children will not be left behind in the race to the schoolhouse (R. Moore and D. R. Moore, 1973, pp. 2-5).

Serious implications of these variations in age of school entry are suggested by the results of recent research in childhood language development which suggests that speech and language development is affected by the age of school entry (Heffernan, 1968, pp. 494, 496-97). The research design of this investigation was undertaken to assess the effects of differences in age of school entry on speech and language development.

The Problem

Background of the Problem

Since early in this century, educators have concerned themselves about the minimum age for beginning academic studies.

Morphett and Washburne (1931, pp. 496-503) directed an investigation from which they concluded that a mental age of six years and six months was the absolute minimum (age) for attaining success in beginning language arts and reading. With the pattern of school entry based upon the child's sixth birthdate during the calendar year he starts first grade, a majority of the beginning first grade children are less than six years and six months. Then one would conclude that most children admitted to first grade on the basis of choronological age alone do not reach the M.A. level required to attain success in beginning language arts and reading until toward the end of the first grade year. Other studies and experiments undertaken to determine the optimum age for school entry and commencement of academic formal education may be cited (Riles, 1971, p. 29; Education Commission of the States, 1971, pp. 1-5; Rowhrer, 1970, p. 37). Though some authors conclude that early school entry is optimum (B. White, 1972, pp. 610-12; Brademas, 1972, pp. 612-13; Riles, 1972, pp. 613-14), the consensus of studies supports a school entry age six years six months or higher (Davis, 1952, pp. 140-41; Keister, 1941, pp. 587-96; Carroll, 1964, p. 290; Halliwell and Stein, 1964, p. 19; Morphett and Washburne, 1931, pp. 496-503; King, 1955, pp. 331-36; Olson, 1952, pp. 85-124; Ilika, 1963, pp. 29-43; Bigelow, 1934, pp. 186-92; Carter, 1956, pp. 91-103; Baer, 1958, pp. 17-19; Green, 1962, pp. 41-47; Forrester, 1955, pp. 80-81; Mawhinney, 1964, p. 25).

Several studies (Boland, 1963, pp. 3-5; Cole, 1963, pp. 282-84; Geber, 1958, pp. 185-95; King, 1955; Ilika, 1963, pp. 85-124; Gott, 1963, pp. 29-43; Rowhrer, 1970, p. 37) have reported relationship between age of school entry and development of language skills. Although these studies were not specifically dealing with language development, they do indicate that early school entry has an adverse effect on language skills.

The United States currently is witnessing an interesting development--a drive for earlier and earlier (entry age) schooling for cognitive growth for "all" children. This trend appears to be either overlooking or simply ignoring many of the important findings of developmental research which point in directions other than that which early childhood education is now generally going. Findings of studies on early vs. later school admission, neurophysiology, cognition, and maternal deprivation do not indicate a need or justification for earlier childhood education.

R. Moore has written:

> While such instances of oversight are certainly not new to American education, the evidence and implications not only appear to be clear, but also warn of possible damage to young children because of maternal deprivation occasioned by early schooling--resulting in childhood maladjustment, motivational loss, poor retention, deterioration of pupil attitudes, visual handicaps, and a wide variety of other physical and behavior problems including speech and language disorders, and minimal brain dysfunction (1972, p. 616).

Limitations of the studies cited above may be noted. The most important limitations are: (1) they are indices of success in achievement; (2) they reflect a tendency to ignore the role or influence of individual variation; and (3) the relationship of the age of school entry and subsequent language and speech function is dealt with only in an incidental way. These prior studies would indicate there is a need for further research.

The question may be raised whether the early entrant to first grade shows language and speech function in the upper elementary grades (4-8) that is comparable to, inferior to, or superior to, that of grade peers who are older upon entry to school.

Statement of the Problem

It was the general purpose of this research to question whether or not the age of school entry is related to subsequent language functioning in the intermediate grades (4th to 8th). The specific purpose of the investigation was to test the null hypothesis that no significant difference will be found in measures of language performance obtained from two groups of children in grades four, five, seven, and eight which are differentiated on the basis of the age of entry to first grade. The groups were defined in the following manner: Group (1) - Early Entrants, composed of children who were six years three months or less at the time they entered first grade; and Group (2) - Late Entrants, composed of children who were six years eleven months or older when they entered first grade. The groups were otherwise similar in non-language intelligence, school grade, sex, and socioeconomic status.

Importance of the Study

The importance of language and language-learning has been clearly stressed by the work of Bloch and Trager (1942), Boas (1911, p. 67), and Whorf (1938, pp. 1-46). A summary of this consensus has been well stated by Bloch and Trager:

> Without language, human society is unthinkable; language is the link between otherwise unconnected nervous systems, and thus the means by which a stimulus acting on one man may produce an effective response in another, or in all members of the group (1942, p. 5).

To the extent that the age of school entry may affect subsequent language functions, a study of school entry and its relationship to subsequent language development will be of value in planning school programs.

In California, pupils may be admitted to kindergarten if they will be five years of age on December 2, and theoretically to first grade if they will be six on December 2. California's state school superintendent, Wilson Riles (1972, pp. 613-14), is currently seeking legislation to authorize schooling for all four-year-olds. This move would easily sweep all four-year-olds into early entrance to schooling and cognitive learning regardless of what the facts are (R. Moore and D. R. Moore, 1973, pp. 2-5).

In keeping with the advice given by E. White (1903, pp. 234-35; 1872, p. 436; 1865, p. 137), many parents who enroll their children in Seventh-day Adventist private schools do not enter their children in first grade until they are nearly seven years of age, or more. If the educational planners have their way and early schooling programs are implemented, the pressures on Seventh-day Adventist parents to enter their children earlier in first grade will be overwhelming (R. Moore and D. R. Moore, 1972, pp. 1, 7, 9).

The results of this study will provide important evidence to guide parents in relating to these pressures.

The answers to these questions were sought through an investigation of children who were in the same private school system from first grade to the present time. These pupils were divided into two groups in the following manner: Group (1) - Early Entrants - composed of children who were six years, three months or less at the time they entered first grade; and Group (2) - Late Entrants - composed of children who were six years, eleven months or older when they entered first grade.

The groups were otherwise similar in non-language intelligence as indicated by scores of the Short Form Test of Academic Aptitude (Sullivan, Clark, and Tiegs, 1970, pp. 1-6) which were obtained for each student during the fourth grade. Thus the pupils were compared only with others of comparable learning ability rate. The groups were compared in achievement in speech and language evaluations by speech pathologists. The results were tested statistically for significance.

Background and Delimitation

Setting of the Study

The subjects for this study were selected from four private schools in three Southern California counties: Orange, Riverside, and San Bernardino. The schools selected are in the unified private school system of the Department of Education of the Southeastern California Conference of Seventh-day Adventists. These schools were selected because they were known to have proportionately large numbers of late entrants to first grade.

Population

Children in this study were selected from the current fourth, fifth, seventh, and eighth grades. No attempt was made to establish family income criteria for inclusion in or exclusion from the study. In general, the subjects were from middle-class families, but there were subjects of both wealthy and poor families.

Delimitation

In conducting the investigation, no attempt was made to:

(1) compare ability in mathematics, or languages learned, per se versus language development:

(2) investigate language teaching, per se:

(3) compare or explore the implications of sex differences;

(4) report a longitudinal study of language development through the elementary school years;

(5) investigate intelligence and language.

Another aspect of this study is that the data are derived from samples, and this is not a study of the population of early and late entrants of the four schools selected. For example, students were excluded from the study if at the time of school entry they had recently come from a foreign country, or if it were not possible to match students on the basis of the matching criteria established.

Although the Southern California area provides an ideal opportunity for this investigation, it is recognized that the potential number of students for this study is small. The number of subjects was limited because so few children are admitted to first grade at age seven or above. The number of subjects was further limited because of the necessity of having matched samples in the two groups. Because of the size of the sample, this is considered a pilot study.

Definitions of Terms Used

The terms "early" and "late" in reference to entrants to first grade are used only in keeping with the concept of the pupil's chronological age at the time of entry to first grade enrollment.

Group 1 - Early Entrants

For purposes of the present study, children who were six years three months of age or less at the time they entered first grade shall be interpreted as "Early Entrants" - (E-E).

Group 2 - Late Entrants

Throughout the report of this investigation, the term "Late Entrants" - (L-E) shall be interpreted as meaning children who were six years eleven months or older when they entered first grade.

School Year

For purposes of this study, grade achievement scores are expressed as for a year of ten months (e.g. the score, 4.6, means fourth grade, sixth month level of achievement). This permits handling the scores as whole numbers and decimals for the purpose of finding means and testing for statistical significance. This method is the usual system in statistical analysis used in educational research.

Experimental Design

The present investigation consisted of a statistical analysis of the scores of selected measures of language functions obtained from two groups of fourth through eighth grade school children. The subjects of the two groups were selected to assure that they were matched for sex and school grade with no significant mean differences in non-language I.Q. and socio-economic status rating. The criterion variables of language function analyzed included:

1. Mechanics of English language
2. Expression of English language
3. Spelling
4. Total general language development
5. Silent reading vocabulary
6. Silent reading comprehension
7. Total silent reading skills
8. Oral reading accuracy
9. Oral reading comprehension

10. Oral reading rate
11. Consonant articulation
12. Inflection
13. Vowel production
14. Language productivity
15. Syntax quotient
16. Abstract-concrete language

Opportunity to study the relationship of the age of entry to first grade and subsequent language development was seen in the practice of the Seventh-day Adventist private elementary schools in Southern California. During the past decade or more, parents of some children have elected to hold their children out of school until between seven and eight years of age. At the same time, other children entered the first grade classes of these schools with entry ages of between five and six years. This private school system seemed to provide a desirable setting to investigate the relationship of age of school entry and the subsequent language development.

This investigation will utilize the opportunity uniquely provided by the Seventh-day Adventist private school system to study the relationship of school entry to subsequent language development.

Scope of the Study

This research study will attempt to answer the following questions:

1. Are measures of language development obtained from children who entered school prior to the age of six years three months and are now in 4th to 8th grades different from measures obtained from class

peers who were older at entrance to first grade?

2. If differences are noted, does this difference appear in all language areas?

A variety of test instruments were employed to obtain measures of performance of the criterion variables. The data were analyzed by analysis of variance procedures. For purposes of this study, results which indicate a probability of chance occurrence of .05 or less were considered significant.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Much has been written in regard to the development of language during the age span from five to twelve years, the developmental factors of language, educational philosophy and implementation in relation to general development, and the acquisition of language. Consideration also must be given to the currently available evidences of the relationship of the effects of age of entry to school upon language development, learning, and overall development. These evidences then must be considered in the light of the influence other effects have upon these language and learning areas.

Development of Language during Age Span from Five to Twelve Years

In order to understand the development of language in children during the age span from 5 to 12 years, language must be accepted as a form of learned behavior. An important concept is that children are born with an innate faculty, capability or ability to acquire language. Although language seems to be learned, the innate faculty functions within the framework of biological development. During the age span of the first four or five years of life, the child's language acquisition is primarily in terms of auditory-vocal language. Upon entry to school and particularly during the age span of five to twelve years, the acquisition of read-written language is seen.

In terms of the child's acquisition of language, attention must be drawn to the major subdivisions of language development: (1) auditory-vocal language; (2) read-written language; and consideration also should be given to (3) the interrelationship of read-written to auditory-vocal language.

Auditory Vocal Language

Auditory vocal language. Auditory-vocal (spoken) language is recognized as the natural language. Contemporary research indicates that children begin to use spoken language without any specific instruction (Myklebust, 1965, pp. 2-3). By the age of five to six years, the child shows evidence of understanding much of what is said to him (Van Riper, 1954, pp. 5-11). At this age, the child is using an expressive vocabulary of between 6,000 and 48,000 words (M. Smith, 1941), is saying sentences that indicate that he has a basic understanding of the grammatic structure of his language (Gray, 1950, pp. 38-39), and is using the phonologic system of his language with reasonable skill (Lenneberg, 1967, pp. 38-39).

During the school years, growth in language function is evidenced mostly in the areas of vocabulary, length and complexity of sentence structure, and abstractions of concepts expressed (Myklebust, 1965, pp. 3-7).

General maturation. Speech and language, as relatively complex functions, appear to depend on maturation for development (Lenneberg, 1967, pp. 139-42). With a normal environment, therefore, speech and language-learning by the child depends on a step-by-step process of maturation. According to Van Riper the child learns speech and language when he is "ready" as maturation probably sets the pace for speech-learning (1954, pp. 10-37).

Auditory discrimination. The process of speech and language is seen as dependent upon auditory discrimination, and neuromotor development. As a child matures in development from birth to adolescence, there is a progressive gain in his ability to discriminate speech sounds. Wepman (1969, p. 106) concluded that in some children the combination of auditory discrimination and memory--"ability to retain and recall speech sounds"--is not well developed until the age of nine.

Inflection patterns. A related factor which must not be overlooked is that of acoustic variables. There are several ways in which acoustic variables contribute to perception of speech. These include: (1) phonologic structures; (2) prosodic structure (rate and rhythm); and (3) inflection. The role of phonologic and prosodic structure has been explored extensively (Wepman, 1969, pp. 1-6; Cole, 1938, p. 282; Myklebust, 1965, pp. 1-10). In addition to pitch patterns per se, research has indicated that intensity also has a role to play that contributes to the understanding of a spoken utterance (Stevens, Volkman, and Newman, 1937, pp. 185-90; Zurmuhl, 1930, pp. 61, 40-86; Stevens and Davis, 1938, pp. 69-75; Stevens, 1935, pp. 150-54; Miles, 1914, pp. 13-66; Ekdahl and Boring, 1934, pp. 452-55). The important point of these studies is that structured variations in the changes in contours or patterns of pitch and intensity have important implications for understanding a spoken sentence.

For some reason, differences in inflection appear to have been neglected in much past research, although it is an important element of speech of early childhood. Van Riper (1954, p. 487) stated:

> (1) In English we tend to alternate stressed and unstressed syllables. (2) Words of three or more syllables are accented on the first syllable except when it is a prefix. (3) Compound words are accented on the first syllable.

It seems that pitch variations are responsible for inflection. Of course, there is the basic level of pitch of an individual speaker's vocal sounds, as was pointed out by Fries (1945, pp. 20-21). Women and children have a higher pitch level than fully-developed men's voices. Fries stated that this basic pitch difference appears not to be significant linguistically. The linguistic problem consists of changes in patterns or contours of pitch. Fries reported the following instance:

> ....if we pronounce in a relaxed normal American English way the sentence "He went to the office," we may observe three important matters of pitch.
>
> 1. The first four words seem to be practically on a level--the normal pitch level of the voice of the speaker.
> 2. The first syllable of the word "office" is distinctly higher than this normal pitch level of the speaking voice.
> 3. The last syllable of the word "office" is distinctly lower than the normal pitch of the speaking voice (1945, pp. 20-21).

Neuro-motor maturity. Just as there are maturational factors essential to auditory discrimination, the neuro-motor development is essential not only to produce the sounds of the language but also for the child's experience upon which language is built. This indicates that there is a basic neuro-motor maturation also (Lenneberg, 1967, pp. 139-42; Strang, 1964, pp. 164-65; Carter and McGinnis, 1970. pp. 51-52; Shelton, Arndt, and Mil, 1962, p. 247; Bosma, 1973, p. 265; and Bosma and Smith, 1961, p. 434.

Inner language. Another aspect of the early development of language and speech is the role of the interrelations of speech and the thought processes. Vygotsky (1962, pp. 52-118) traced the manner in which thought processes were given classificatory structure by speech, and the structural limitations of spoken language could be related in a process he identified as inner speech. This is a process of thinking in word meanings. He envisioned language as an important tool in the thinking process as the child develops. He described language and thought processes as initially being two distinct functions, but that as a child develops he saw that (1) thought becomes more verbal, and (2) language becomes more non-verbal (i.e., speech loses the structure of language). In this way, then, the child begins to deal with concepts in establishing and analyzing and discussing relationships without having to go through the formalities of language. That is what Vygotsky (1962, pp. 9-24) calls "cognitive thinking" and "deep thinking."

Although the descriptions of Piaget (Overton, 1972, pp. 95-103) suggest that a child's verbal behavior progresses from unsocialized, verbalized, egocentric speaking to socialized and abstract communication, he (1962, pp. 1-10) felt that his work was in basic harmony with that of Vygotsky.

While the work of Vygotsky and Piaget is concerned basically with language processes that occur at the early age period (two to five years), the process also continues into the higher years period. For instance, Piaget observed language and thinking processes becoming more and more abstract, more symbolic and more complex in the eight to twelve years age period of the child.

Read Written Language

Myklebust (1965, pp. 12-13) has stressed that the read-written form of language is a learned skill. It is based, to a large degree, upon the auditory-vocal language which is present. There are several factors that must be recognized as important in the child's learning to build read-written language upon the speech foundation. Two factors which are of critical importance are (1) auditory discrimination, and (2) visual discrimination.

Auditory discrimination. There is evidence that auditory discrimination has important implications for reading mastery. Carter and McGinnis (1970, pp. 51-52) reported that the ability to differentiate between speech sounds is considered by many scientific investigators to be of prime importance in developing effective reading skills. If a child is unable to differentiate between speech sounds, he will not be able to reproduce the sound correctly in speech. This difficulty also would handicap the child in recognition of written words, since incorrect articulation of sounds would lead him to pronounce a word incorrectly and thus not recognize the relationship between the spoken word and the written symbol which provide the basis for learning the rules of phonics (Strang, 1964, pp. 164-65; Cole, 1938, pp. 282-84).

Visual Discrimination and maturity. The second factor that is critical to the development of reading is visual maturity. A number of studies have established that a child's visual system reaches maturity gradually. This has been summarized by Chalfant and Scheffelin (1969, pp. 23-26). Findings on the child's visual system are closely related to brain development. Chalfant and Scheffelin (1969, pp. 23-26) pointed out that visual stimuli in the brain traces the same electrical path as do the impulses involved with cognitive activity that occur between the thalamus and the cortex. If these connections or nerve paths are not fully complete in their development, the visual signals probably are not interpreted clearly. These authors added that:

> The complex nervous system (CNS) processing of visual stimuli involves: (a) visual analysis, the separation of the whole into its component parts; (b) visual integration, the coordination of mental processes; and (c) visual synthesis, the incorporation or combination of elements into a recognizable whole. A review of the literature reveals a variety of cognitive tasks requiring the analysis, integration, and synthesis of visual information (1969, pp. 23-26).

Neurophysiologists, psychologists, and medical personnel have reported stages at which children are normally ready to think abstractly, or organize facts, and to sustain and retain learning without undue damage and strain. The timing of the stages they reported are remarkably similar to the findings on the development of the child's visual system reported by Chalfant and Scheffelin (1969, pp. 23-26). An explanation for this relationship is seen in the work of Yakovlev (1962, pp. 3-46) who demonstrated that the nerve fibers between the thalamus and cortex are not fully insulated, or completely developed by the process of myelinization until after age seven. Thus it is not difficult to understand that the process of vision cannot be ready until the brain is relatively mature. This would lead to the conclusion that reading readiness depends upon appropriate maturation and controlled integration of complex neurological systems.

An important implication of the process of CNS development is illustrated by the work of Cole (1938, pp. 280-82), who studied the age at which a child can fixate on objects at close range. In her studies she observed that letter confusion of "d" for "b" and "p" for "q" was related to ability to fixate. She concluded that until children are eight years old, one cannot "be perfectly certain the eyes are mature enough to avoid such confusions" (1938, pp. 282-84). In the 1963 revision of her book, she noted that not more than 10 percent of five-year-olds can perceive the difference between similar letters.

Carter and McGinnis (1970, pp. 51-52) explained the process a little more fully. They explained that there are six small muscles of each eye which must coordinate precisely in order to focus on near objects and produce only a single image. This coordination is dependent upon maturation. They noted:

> ....the visual mechanism at six years of age is unstable and many children have difficulty in fixating at definite points and in keeping their place in reading. Children at this age make many regressive movements and are inaccurate in moving from one line of print to the next. (1970, pp. 51-52).

Throughout the studies cited (Chalfant and Scheffelin, 1969; Cole, 1938, 1963; Carter and McGinnes, 1970), it is evident that the authors were concerned with two areas which are important for visual discrimination. The first of these is in near-distance fixation. The second concern is related to tracking that is lateral side to side coordination. Cole (1938, pp. 280-82) observed that some children were unable to fixate on objects at close range until age seven or eight or later and noted that when children could not adjust to the difficulties and discomforts of tasks requiring close vision, they simply gave up trying to read.

Ilg and Ames (1965, p. 241) observed that (1) it is well established that normally the child's vision develops gradually until he is at least eight years old; and (2) if a child cannot shift his focusing posture from the chalkboard to his desk by age eight, he is in trouble.

Thus, both of these areas are important concerns for a child to be able to handle reading, particularly reading close to him, or with the task of fixing or shifting from far to near. Particularly in the first grade, the near-far shifting is of great importance in the child's acquisition of academic skills.

Intersensory development. Intersensory development is important to reading and language development itself. This has been shown to be important to reading and language development by Myklebust (1965, pp. 1-10; 1954, pp. 12-15; 1957, pp. 512-13). Still more complex and demanding of maturity are the intersensory demands on the young child.

Birch and Lefford (1963, p. 39) studied intersensory development in children from five to eleven, with a mean I.Q. of 115. They found that intersensory maturity did not emerge until the children are at least seven or eight years old. In an experiment, they explored the relationships among visual, haptic (active manual exploration) and kinesthetic... sense modalities for recognition of geometric shapes. The results showed that the ability to make various intersensory judgments (same-different) follows a general law of growth and improves with age. For judgments of both identical and non-identical forms, the least number of errors was made in visual-haptic judgments. However, only seventeen percent of the five-year-olds made no errors in judgment using visual and haptic information. None of the five-year-olds performed without errors with haptic-kinesthetic or visual-kinesthetic information.

The integration of the kinesthetic modality with visual and haptic modalities does not take place until the children are seven or eight years of age. From their results, Birch and Lefford concluded that:

> The evidence for normal...children strongly confirms the review that the elaboration of intersensory relations represents a set of developmental functions showing age-specific characteristics and markedly regular curves of growth (1963, p. 39).

According to Overton (1972, pp. 95-103), Piaget divided the child's life into four major developmental steps as follows: (a) the sensory motor period--birth to two years; (b) the preoperational period --two years to seven years; (c) the period of concrete operations--seven to eleven years; and (d) the period of formal operation between eleven and fifteen years. This sequence coincides well with the findings of the neurophysiologists, psychologists, and medical personnel cited above.

Interrelationship of Language to Other Factors

Intellectual functioning is stimulated by symbolic activity, and language development is promoted by intellectual functioning (Myklebust, 1965, pp. 8-10). There is general consensus that reading provides a medium for language activity to the extent that language promotes thinking (Myklebust, 1954, pp. 9-15; 1957, pp. 503-7, 512, 518-20).

Written language is not "time-bound." If communication is written, it may be processed at the receiver's own rate; however, if communication is spoken, it is processed at the rate of the speaker at the time spoken, or it is not processed at all. Thus written language (reading and writing skills) provide the child with the opportunity of representation--scanning, reviewing, and looking at the communication without completely depending on memory (Myklebust, 1965, pp. 1-11).

The symbols of spoken language are represented in a graphic form. Written language is recognized as a graphic form of the auditory symbols of speech. An integral interrelationship is seen between auditory-vocal language and read-written language. Thus the role of reading-writing skills as tools of language and thought and of the cognitive development of the child is seen.

Psychological development and language. Jesperson (1922, pp. 11-50) stated that the child is not ready to use the language of the community until he is about eight years of age. The basis for this observation may be explained by assuming maturational changes within the growing child. Support for this is seen in the work by Lenneberg (1967, p. 139) who stated that the emergence of speech and language habits are accounted for by assuming maturational changes within the growing child.

In addition to showing that there is a progression of development, there is research to indicate that the child must be allowed to progress at his own rate. Hymes, for example, reported that:

> A child pressured into achievement before he is ready...runs the risk of becoming a less sturdy, less sure, a less sound, and healthy personality...resisting and rejecting when he is a free agent the learning that is forced on him (Hymes, 1970, p. 136).

Ames, Gillespie, and Streff (1967, p. 57) also state:

> Inevitably, many children have not merely one but several of the problems just listed (immaturity, vision, or perceptual, emotional disturbance, brain damaged, retarded, atypical personality, endocrine imbalance, etc.). Whatever other difficulties they may experience, the majority of children referred to our clinical service (i.e., the Gesell Institute) because they were doing poorly in school were overplaced and underendowed for the schoolwork being demanded of them (1972, p. 57).

A final factor to mention in dealing with the psychological factors contributing to language development is motivation. The role that motivation plays in learning language is important. Children do not learn effectively when there is no motivation for learning.

When a child is placed beyond his developmental level, and thus doing the "wrong" developmental tasks, he will lose his motivation to learn language. Strang (1964, pp. 164-65), and Carter and McGinnis (1970, pp. 51-52) observed that when the children cannot adjust to the difficulties and discomforts of tasks requiring close vision, they simply stop trying to read. Many bright children under pressure and frustration lose their motivation, when if allowed to mature they may have done well.

Language and verbal and non-verbal intelligence. Another factor that should be considered in a discussion of the relationship of language and language development is that of the relationship of intelligence and language development.

Language development per se is not an index of intelligence. This is evident by the sequence of emergent language in most children who are using language effectively by the time they have achieved a mental age of 4 years. Correlation between age of onset of speech and I.Q. have been reported by Van Riper (1954, pp. 1-55), however. His research indicates that the children who are more intelligent show an earlier age of onset of speech.

When chronological age was held constant, there was a general correlation of .39 between speech proficiency and mental age, and .37 between mental age and articulation proficiency. Although all of the correlations are low, they do point to a relationship between intelligence and degree of speech and language development.

Language, non-verbal intelligence and ethnic factors. In addition to intelligence, there is evidence that language environment will influence language rate and development (Van Riper, 1954, pp. 487-88).

Of particular importance is the role of bilingualism. Although there are a number of factors operating, there is evidence that the monolinguals score higher on the non-language section of the California Test of Mental Maturity Short Form Test of Academic Aptitude (Kittell, 1959, pp. 263-68).

The influence of age and bilingualism on intelligence test scores appears to decrease when non-language tests are used. Arsenian (1937, pp. 340-43) discovered no significant correlation between the age differences and the degree of bilingualism and the results on the Pintner Non-Language Test. Comparable findings were the findings by Darcy (1934, pp. 499-506) in her study of pre-school children. She found significant variations in favor of younger monolinguals on the Stanford-Binet and significant differences in favor of bilinguals with the Atkins Object-Fitting Test.

The California Test of Mental Maturity was administered to a sample of bilingual third-grade children and one of monolingual third-grade children by Kittell (1959, pp. 263-68). It was found that socio-economic class variations were in favor of the monolingual group. On the language section, the monolingual group who were older obtained higher scores than the younger group, as well as higher scores than the bilingual group. The monolingual children scored higher on the language section than on the non-language section. On the total mental age there was no significant difference between the monolingual and the bilingual group.

The application of non-language mental age scores does not eliminate the differences in IQ test scores for different ethnic groups, although as found by Brown (1956, pp. 36-57) it tends to decrease the differences slightly.

The foregoing implies that there are certain distinct limitations upon the reliability of matching children of different language backgrounds and ethnic groups in intelligence. Nevertheless, it seems that the influence of age and bilingualism and the ethnic factors decrease if non-language tests are administered.

Relation of Schooling to General Development of Speech and Language

The general goals of education are to develop skills and strengths of the child in order for him to be prepared to realize his potential as he takes his place in society. The general consensus is that the school setting will provide an environment in which a child learns to accomplish certain things. It is felt that the child will learn: (1) to interact with peers and other people; (2) to be more self-reliant and self-dependent (Riles, 1971, p. 29; 1972, pp. 613-14; Brademas, 1972, pp. 612-13; B. White, 1972, pp. 610-12).

Reading and Writing Skills for Communication Functions

In the educational process, the school introduces an environment for learning, reading and writing skills (Myklebust, 1965, pp. 1, 4, 8-10, 13-14). Although many skills may be included in education, it is recognized that the development of language and communication is of prime importance. Enmeshed with the development of language and the educational process are the skills of reading and writing (Myklebust, 1965, pp. 12-15). Provision is made for structured stimulation for reading and writing to increase the child's basic function--language. Language becomes the child's most fundamental characteristic (Myklebust, 1965, pp. 13-14) as the child progresses in school. Myklebust was in agreement with Gesell and Ilg (1946, pp. 388-89) that: (1) a child's writing is large and awkward at age seven, (2) at age eight spoken language is more basic than written, and (3) at age nine the child uses the written form more as a tool (motor skill) relatively under good control.

Language skills. Pioneer child researchers, Gesell and Ilg (1946, pp. 388-89), noted that school tasks such as language skills in reading, writing, spelling, arithmetic, "depend upon motor skills which are subject to the same laws of growth which govern creeping, walking, grasping" (1946, pp. 388-89).

The awkwardness a young child may exhibit, they observed, "is often sadly overlooked by teachers and parents"--who should be as flexible in their attitudes toward the child's readiness to read as toward his readiness to walk (1946, pp. 388-89):

> When the school child was a baby, the adult attitudes tended to be more reasonable. One did not say he should walk at the most seasonable time, one was more interested to observe the stage and degree of his preliminary development. If reading readiness and walking readiness are appraised on similar grounds, more justice is done the child (1946, pp. 388-89).

Delay in reading. Because the Morphett-Washburne (1931, pp. 496- 503) findings had set up the earliest age for beginning reading as a mental age of six and one-half years, many educators began to think of postponing reading for those children who had not reached 78 months of mental age. An early study by Thomson showed that a delay in beginning reading until the chronological age of six resulted in a small reduction of reading failures, a big reduction of children revealing anxiety or nervous tension (from 44 percent to 3 percent), and a tremendous change in motivation to read (from only 8 percent to 91 percent) (1934, pp. 445-46). It is noted that although motivation was increased, the reduction in reading failures was small.

Witty conducted research and reviewed other investigations (1936, pp. 401-18) and concluded that the typical reading materials could not be mastered by the average six-year-old child. He concluded: "This implies that most children would have their introduction to reading when they are about eight or nine years in chronological age" (1936, p. 413).

As individualized programs of reading instruction were included in the school programs, including the practice of permitting the child to set his own timetable, delayed reading for individual children was accepted as justified. Boney (1944, pp. 211-14) talked of the system of individualized instruction in reading used in his school in New Jersey. Children set their own timetables for beginning reading, and some did no reading until third grade. He claimed that the slow starters gradually overtook the others, and at the end of seventh grade, 70 percent were above grade level.

Most of the evidence seems to indicate that the postponement of reading and promotion without reading ability does not solve the problem of the presence of underage children in first grade, nor the problem of the range of individual differences, but only pushes it into another grade level. The school patrons have not been convinced on the value of the idea of non-reading first grade programs. The use of a transition grade (pre-first) between kindergarten and first grade has received more acceptance by parents of school age children.

The reviewed research appears to indicate that delayed entry is a valid solution to problems posed by developmental factors. The potential for individualized instruction was also considered.

The goal of education is to provide a structured sequence for the development of perceptual and cognitive behaviors. In kindergarten, for example, some of the pre-reading materials are designed to promote perceptual and precognitive behavior, and recognizing patterns. In first grade, the child takes these skills that have been consolidated and adds recognition of word patterns, and symbolic behavior. In the second through fourth grades, instruction is promoting these reading and writing skills of reading and writing as tools of learning about more complex information as the children mature (Myklebust, 1965, pp. 13-14).

Relationship of Age to Educational Factors

Research has indicated that there are developmental factors that will influence a child's success in the first grade experience. For this reason, research has been directed toward the question of the optimal minimal age to begin reading.

Mental age and reading readiness. After World War I when objective measures of reading skills were readily available, it became evident that a large proportion of first grade children had failed to learn to read during their first year. Considerable study was given to this problem regarding the question of the effect of age of school entry, especially the entrance age to first grade.

Research indicated that the area of reading was an important primary concern. Wide and extensive research influenced Gates (1939, pp. 50-55), Betts (1943, pp. 199-230), and others to set up standards of mental maturity for beginning reading. Betts concluded that the instruction in reading did not satisfy any of the needs of four- and five-year-olds, and some six-year-olds, although a few learned to read before the age of six.

Morphett and Washburne (1931, pp. 496-503) conducted an investigation from which they concluded that a mental age of six years and six months was the absolute minimum age for attaining success in beginning language arts and especially reading. The results of this study lead to the conclusion that most children admitted to first grade on the basis of chronological age alone did not reach this same mental age until late in their first year (i.e., first grade). For many years educators seriously considered requiring this as an entrance factor. However, the idea was not very widely implemented into school practice.

The consensus of much of this research would indicate a M.A. of six years six months as requisite to success in reading skills. Witty (1946, pp. 257-70) cautioned against M.A. alone as an index of reading mastery:

> Readiness is a developmental condition in which a variety of factors play important roles....It has been demonstrated repeatedly that delaying reading instruction until the child's mental age is six years and six months will not insure successful reading.

Research supports the conclusion that, no matter what the school entry age limits might be, the pupils who enter at the earliest possible age have significantly more problems and have lower achievement than those matched for I.Q. who enter at the upper legal entry age range.

In addition to the studies of minimal optimal age, some investigators have given consideration to the effect of the results obtained when children were admitted to the first grade experience on the basis of mental age criteria.

Some school districts have experimented with (as a basis for admission to first grade) using mental age, combined with evidence of physical and social maturity. Ammons and Goodlad (1955, pp. 21-26) summarized the findings in a survey. Rowland (1959, pp. 18-23) made a survey to determine the situation of the school pupil's entrance age problem. The districts which reported the use of tests to admit underage children preferred individual psychological tests, and in more than 50 percent of the cases were moved by the desire to accelerate the more mature pupils. There were frequent reports of trouble with parents of children rejected. In Pittsburg, the rejection rate reported by Birch (1954, pp. 84-87) was as high as nine out of ten. In an opinion poll (Nation's Schools, 1955, p. 6) of school superintendents taken by Nation's Schools, many of them expressed agreement with the idea but few were actually using it. They stated as their reasons that it was not practical, was very expensive, and was limited in value by the inadequacy of both tests and available examiners. Similar opinion poll results were reported (Nation's Schools, 1973, p. 78).

A study that should not be overlooked is the work by Gates (1937, pp. 497-508) who questioned whether six years six months is the optimal age for beginning reading, or are there other factors.

Gates (1937, pp. 497-508) conducted a study to test the necessity of mental age of six and one-half years for beginning reading. He advanced the hypothesis that the crucial mental age level will vary according to the materials, type of teaching, and size of class. He involved four groups varying from individualized instruction and best methods to inferior materials in large classes and with mass methods. He found that with the best materials and methods, the minimum mental age required for success in beginning reading was five years, and for the least amount or inferior materials and with mass methods six years and five months, and here even those with a mental age of seven had trouble. He concludes that the question is not what mental age is necessary to begin reading, but what materials and methods are necessary for beginning reading for optimum success.

ECD studies involving retention of learning have been done at virtually all grade and socio-economic status (SES) levels, with remarkably uniform results. Researcher B. U. Keister (1941, pp. 587-96) reported an investigation in which he noted that five-year-olds often could develop enough skills to get through first grade reading somehow, but their learning generally was not retained through the summer vacation.

Reading difficulty. As has been previously discussed, a great deal remains to be learned about the child's visual system. It is well established, however, that normally the development of the vision modality is gradual until he is at least eight years old. Authors cited previously (Ilg and Ames, 1965, p. 24) indicated that if a child cannot shift his focusing posture from the chalkboard to his desk by age eight he is in trouble. But Ames (1967, p. 57) stated that there may be problems, for example, in trying to teach the five-and-a-half-year-old to read: "...he easily loses his visual orientation, and thus may often reverse his letters."

Readiness sex differences. The evidence of many research studies indicates that there is a significant difference in early scholastic achievement of boys and girls. Betts concluded that the sex differences lay more in the inability of boys to express themselves and demonstrate their intelligence. He stated:

> In general, sex differences are found in the language development of preschool children and first grade entrants...Sex differences in readiness for reading may be overemphasized (1943, pp. 225-26).

Reports on sex differences are included in most of the investigations on entrance age to first grade and kindergarten. Devault (1957, p. 118) pointed out that "girls consistently had higher total achievement scores than boys" and generally higher reading achievement. Carter reported that "the factor of chronological age has more effect on boys," boys consistently made lower scores and fewer high scores. It is interesting to note, however, that the normal age boys did significantly better than the underage boys in language arts, spelling, English, reading, and mathematics (1957, pp. 102-103).

Baer (1958, p. 15) and King (1955, pp. 35-36) in their studies of matched groups found that girls were rated higher than boys on personal traits, and they found a greater incidence of speech problems among boys. Birch (1954, p. 85) commented upon greater numbers of girls admitted underage to school:

> It may be that the important factors were that girls tend to develop verbal abilities in general earlier than boys and that bright girls tend to manifest their brightness to their parents earlier than do bright boys.

Olson reported results which constitute a fitting summary of the best of the findings reviewed in this chapter:

> Differences in the rate of maturing between boys and girls are very real and usually favor the girls. Sex differences become particularly important at the lower end of the distribution of maturity rates, where the excessive ratio of boys to girls reported by Dr. Pauly may be found. From the point of view of educational practice, however, differences between the sexes are minor when compared to differences that exist between children of the same sex.
>
> At every age, girls exceed boys in reading age. This difference, however, is one of only from one to four months. The fact of greatest importance in the table is the great variability for both boys and girls. The standard deviation is nine months at seven years of age and becomes progressively greater until it is over two years at a chronological age of eleven years (1952, pp. 29-30).

While Pitcher and Ames found "surprisingly few" systematic studies of early sex differences, they concluded that one factor appears to be clear: "so far as school goes, on the average girls are ready to meet the demands of first grade a good six months earlier than are boys" (1964, pp. 44, 49, and 51).

This idea that "girls develop verbal abilities and skills earlier than boys" (Birch, 1954, p. 85) raises a question that must be taken into consideration. Can it be that the higher success factor for girls reflects this earlier verbal ability, and that success in school really reflects verbal ability? This is important and significant in light of the developmental concept that learning progresses in sequence, and disturbed sequences equal disrupted and disturbed learning.

Socialization

The process of a child's going to school represents a step in socialization from the small protected home culture to a broader culture of the community (Gray, 1950, pp. 39-40; Jesperson, 1922, pp. 11-50).

The research of Bowlby (1952, pp. 11-12) indicates that entering school too early poses hazards to achieving this goal of wholesome socialization. In fact, it may retard or even prevent the child's orderly socialization stages altogether and subsequently language development as well. Some questioning and disagreement may exist concerning possible damage to the young child by maternal deprivation relative to his early entry to school at the proposed ages of three, four, five, six or even seven years of age. Mothering is still very much in evidence for the child in kindergarten or first grade, and in some cases even later to age eight. If the child were at home during this period the parents and particularly the mother may involve their child in home-based activities helpful in language and speech development. The parents may lead their child in helping with appropriate levels in the daily chores and activities of the home, as the mother uses the vacuum cleaner, washes windows, or prepares meals for the family, etc. If mothers find it necessary to work outside the home or if other certain special conditions and circumstances in the home demonstrate the value of early intervention, a mother surrogate (such as a grandmother or a warm-loving relative, if possible) may help the child in a warm, friendly relationship to participate in the daily chores of the home (Moore and Clausen, 1975, pp. 1-19; Hyder, 1975, pp. 1-17; and Gray, 1971, pp. 127-29). The home-centered education appears to present less deprivation than the child being in school for a period of hours with a constant mother-surrogate, involved directly with the child's activities.

The works of Geber (1958, pp. 185-95), Skeels (1966, pp. 1-66), and Bowlby (1969, p. xiii; 1961, p. 209; 1968, pp. 494-97) show that children become socialized when they are ready to be socialized or when they have developed to their proper socialization stage of maturation. The early entry to school of the young child for social contact outside the home tends to demonstrate that he does not need it.

Social development. Bowlby's (1952, pp. 11-12) study of child-rearing practices showed that when a child is taken from home for early schooling--or remains at home without loving care from someone he trusts --he is vulnerable to mental and emotional problems that will affect his learning, motivation, and behavior. He described maternal deprivation in the following way:

> The infant and young child should experience a warm, intimate and continuous relationship with his mother (or permanent mother-substitute) in which both find satisfaction and enjoyment....
>
> A state of affairs in which the child does not have this relationship is termed "maternal deprivation." This is a general term covering a number of different situations. Thus a child is deprived even though living at home, if his mother (or permanent mother-substitute) is unable to give him the loving care small children need. Again, a child is deprived if for any reason he is removed from his mother's care (1952, pp. 11-12).

This principle was restated nearly 20 years later, in 1969, when he reported that in the Western world the commonest disturbances of attachment "are the results of too little mothering, or of mothering coming from a succession of different people." And these disturbances "can continue for weeks, months, or years--or may be permanent" (1969, p. xiii). Bowlby further pointed out categorically that:

> So long as a child is in the unchallenged presence of a principal attachment figure, or within easy reach, he feels secure. A threat of loss creates anxiety and actual loss sorrow; both moreover are likely to cause sorrow (1969, p. 209).

While Bowlby's work was not directly related to early schooling, his feelings are implicit in determining the optimum environment for child development which includes language (1969, pp. 494-97). Bowlby is speaking of mothering and not teaching, but he insists that parents do not necessarily have to feel inferior as inadequate in their rights and duties of parenthood. The social pressure to move children from home to school at ever earlier ages indeed implies inadequate parenthood. Bowlby (1952, pp. 11-13) insisted that although exceptions may occur, even undesirable homes usually provide more continuity and security for the preschool-age child than a reasonably good care center or school.

Some mothers and ES (Early Schooling) proponents give as the reason for youngsters going to kindergarten or preschool the need for the child's social experience outside the home (Time, Riles, 1971, p. 38).

There are a number of reasons to doubt that he does. Investigators Bowlby (1969, p. 209), Geber (1958, pp. 185-95), and Skeels (1966, pp. 1-66) have shown that if a child is not given warm, continuous (unbroken) mothering--and hopefully, fathering--until he is at least seven or eight, he generally will be less socially mature, less well motivated and adjusted, and will not learn well. These carefully done research investigations demonstrate that science provides support for E. White's (1872, p. 137) statement that "parents should be the only teachers of their children until they have reached eight or ten years of age." E. White (1865, p. 436) concluded that women who are so busy as to be separated from their children are indeed too busy, unless they are forced by circumstances beyond their control. She said: "Many mothers feel that they have no time to instruct their children, and in order to get them out of the way, and get rid of their noise and trouble, they send them to school" (1865, p. 436). In summary Bowlby has indicated the importance of the contact of the child with the mother in early years (1969, pp. 494-97), and E. White (1872-1903) was an early proponent of delayed schooling.

Geber's (1958, pp. 185-95) work in Uganda demonstrated, much like Skeel's (1966, pp. 1-66), that such attention or deprivation reaches beyond the emotional responses of young children (1966, pp. 1-66). Geber found that in great measure the children of low SES mothers who were child-centered who had entered formal education later did better and were more mature in physiological coordination, adaptability, sociability, and speech and language skills than were children from relatively high SES mothers whose children entered formal education at an earlier age. It is important to note that Geber considered the low SES mothers as "child-centered" in their child-rearing practices.

In an experiment conducted in Uganda, Geber (1958, pp. 185-95) reported that in his sampling those babies from relatively high-SES Uganda families with less maternal contact but more involvement in early formal training were much less mature in the above qualities than the babies of the low-SES mothers on tests standardized by Arnold Gesell.

Socialization appears to be the proposed basis for early entry to school. The research does not support this basis for early schooling, as seen in the Geber (1958, pp. 185-95) study from Africa and the other foregoing studies. Other opinions from the viewpoint of a psychiatrist, educational psychologists, and a prolific writer question this basis for early entry.

Fisher (1951, pp. 13-14) doubts that young children should ordinarily be sent to school as we commonly know it before the age of eleven or even before adolescence. From the advantage of his long clinical experience, he stated:

> Psychologists have demonstrated that a normal child commencing his education in adolescence can soon reach the same point of progress he would have achieved by starting to school at five or six years of age. I have often thought that if a child could be assured a wholesome homelife and proper physical development this might be the answer to a growing problem of inadequate classroom space and a shortage of qualified teachers--and the instinctive reluctance of all of us to hand over tax dollars for anything that doesn't fire bullets (1951, pp. 13-14).

Rohwer (1970, pp. 1-6) supported Fisher's statement for wholesome home environment on the basis of a number of studies by educational psychologists including those of Husen (1967, pp. 2-30) who found that the earlier a child went to school, generally the worse were his attitudes toward school, and Elkind (1969, pp. 319-37) and Jensen (1969, pp. 104-07) among many, who noted that it would probably be better if a child did not go to school until he was in adolescence. This belief concurs with the thesis of Fisher (1951, pp. 13-14) who affirmed a need for a primary effort in behalf of the home rather than developing more schools.

In the light of neurophysiological and psychological research, the home-school concept of mother-child-home programs in which visiting teachers would help the mother take care of her own young children in place of the typical preschool or kindergarten holds great promise for the future (Schaefer, 1972, pp. 236-38; Levenstein, 1971, 130-34; Elkind 1969, p. 332). Elkind (1969, p. 332) saw "intellectually burned" children whose formal instruction is not delayed up to certain limits before they reach high school with resultant frustrations and anxieties, and unpreparedness for intellectual success.

Home-based speech/language learning. From previously discussed research, it appears the home is the more promising investment than the school in terms of working with preschool-age children with speech/language disabilities considering the limitations of the state's resources according to Gray (1971, pp. 127-29), Levenstein (1971, pp. 130-34), and Schaefer (1972, pp. 236-38). It must be concluded in the face of the evidence provided by the "Mother-Child Home Program" experiment by Levenstein (1971, pp. 130-34) that there are better and perhaps less expensive means to insure optimum early childhood speech/language development than the approach through early schooling for all children.

This home-based speech/language program is based on the building of self-worth into the life of the handicapped child, who often is catered to or ignored. Rather, the proposal is that the child should be taken into the confidence and friendship of the parent or parent surrogate, and participate in the daily chores of the home according to Moore and Clausen (1975, pp. 1-19), and Hyder (1975, pp. 1-17). These techniques, procedures, objectives, and goals are in agreement with E. White (1865, pp. 436).

Disturbance of Socialization and Skills Development

Disturbance in maturation. The literature reviewed has developed the concept that: (1) maturation proceeds in an orderly fashion; and (2) that disturbances in the sequencing of skills may result in a child's having acquired specific skills; but (3) not the foundation for subsequent development. Thus disturbance in the sequence of maturation may result in breakdown in the emergence of subsequent development (Van Riper, 1954, pp. 10-37; Gray, 1950, pp. 39-40, 94; Birch and Lefford, 1963, p. 39; Jesperson, 1922, pp. 11-50; Lenneberg, 1957, pp. 30-39).

The literature in support of this concept was summarized by E. White (1872, p. 436; 1865, p. 137); Gesell and Ilg (1946, pp. 388-89); Yakovlev (1962, pp. 3-46); and Fisher (1951, pp. 13-14). This concept has been reviewed in greater detail in other sections. A number of students of the young child's brain, including Yakovlev (1962, pp. 39-46) and H. Birch (1963, pp. 27-29), found that children were inaccurate in perception of shapes and grossly inaccurate in attempting to reproduce shapes until the age of ten or older. The children's perceptual errors were like those noted in brain-damaged adults.

Early Versus Late Entry to School

Educational Policies Related to Early Schooling

The age at which a child enters school has become a concern and controversy. In some states, the compulsory attendance laws were written with the lower age limit set at seven or eight years of age, and earlier entrance was left up to the local school administration. Changes in educational philosophy, especially in regard to goals, content, and method of primary instruction, had their influence on school entry age. Social custom which attaches status to early age entry has been reinforced by the recent increase in the number of homes in which both parents are employed. Private schools set their own standards for school entry age under the general guidelines of the state's attendance laws.

Literature Supporting Early Entrance

This is literature that is used in supporting the concept of early entrance to school. The principal studies are those concerned with: (1) early admission of bright children (Birch, 1954, pp. 84-87; Hobson, 1948, pp. 312-21; Cone, 1955, pp. 46-47); (2) social development (Bedoian, 1954, pp. 513-20; Miller, 1957, pp. 257-63); and (3) political bases (B. White, 1972, p. 612; Brademas, 1972, p. 613; Riles, 1972, pp. 613-14).

Early admission of bright children. Investigations on the success of early admission of bright children in Brooklyn, Massachusetts, were reported by Cone (1955, pp. 46-47) and Hobson (1948, pp. 312-21). Children were admitted up to six months under age if the tests showed they had a mental age of five years two months for kindergarten and six years two months for first grade. Cone (1955, pp. 46-47) said that these children immediately began to surpass the regulars in first grade and continued to do so through the eighth grade with only one percent of failure.

He did not support his statement with factual information, but merely referred to the earlier Hobson investigation. These bright children apparently had I.Q.'s of 120 or above and were being compared with "regulars," most of whom were average or low I.Q. children (1955, pp. 46-47).

Hobson (1948, pp. 320-21) pointed out the superiority of the younger group of children in terms of the number of A grades they received, on the number of promotions on trial, and the number of failures He reported that in every grade except kindergarten the underage children admitted by testing procedures greatly exceeded the other children in their grade level in the percentage of earned grades of A, and marks of A and B combined, as well as having a smaller percentage of failures --1.1 percent as compared with 6.2 percent with the regulars. He favored early admission because the children's educational progress is continued without any gap such as that caused by double acceleration.

The findings of early admission by testing in Pittsburgh were reported by Birch (1954, pp. 84-87). He reported that for three successive years an overwhelming majority of the children were making satisfactory adjustments in first grade in all areas--academic, social, emotional, and physical. He noted that more lower level ratings were given in the first year of school and that these ratings tended to go up in later grades.

This study made the mistake of comparing high I.Q. children with the whole group, including the low I.Q. children. Birch's statement about adjustment is rather all-inclusive and sweeping, considering that it is not based on a definite testing program.

Although Birch has been used by some as an argument in favor of early entrance of all children in general, he is not really an advocate of general early entrance to school per se. Actually his research supported the thesis that when a child has developed to the place where the developmental task presented or expected is next in the sequence, he will show growth. He is advocating that the important thing is to choose or select those children carefully and wisely to be certain that they are ready. The advocates of early entrance for all children have stated that Birch said that children can start school early and do well, but have made the mistake of implying that all children may enter school early.

Social development. In addition to school performance per se, several other authors have called attention to social development.

Bedoian (1954, pp. 513-20) made an interesting point in his study of social acceptance of underage and overage children. He concluded that the underage pupils made the best showing with the children at age for their grade in the middle and the overage making the poorest showing.

Miller (1957, pp. 257-63) reported a longitudinal study of children who were underage for their grade in which ten of the 37 pupils were admitted by testing. Of the ten, only five were left by the end of the fifth grade. This fact limits the value of the study. She drew the conclusion that the underage children might be handicapped by physical or emotional immaturity in the primary grade levels but that this situation improves in the upper grades. She observed that they scored substantially above average in popularity and leadership. Although this fact was not alluded to in her conclusion, these younger children, consisting of three percent of the total group, were above average in intelligence as indicated by testing results.

Obviously these high I.Q. pupils were compared continuously with a mixed group which contained mostly average and low I.Q. children. The pupil progress was not reported by standardized testing but by letter "A" and "B" grades. For the ten year period of the study, an average of five percent of the early entrants were retained in kindergarten. The ability of these early entrants was above average obviously, however, their success was accounted for by merely passing their grade, not by achieving up to their mental capacity.

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This study made the mistake of comparing high I.Q. children with the whole group, including the low I.Q. children. Birch's statement about adjustment was rather all-inclusive and sweeping, considering that it was not based on a definite testing program.

Political pressures. The studies of this type have provided a firm basis for much of the political pressures for the early education program (Riles, 1972, pp. 613-14; Brademas, 1972, p. 613; B. White, 1972, p. 612). The politicians have moved beyond the cognitive development per se into the area of general development.

Some authors conclude that early school entry is optimum. B. White (1972, p. 612) defended early schooling by redefining it as "childhood development." He included not only cognitive growth but also health, nutrition, and other services that affect the growth of the child.

The concept was analyzed as the basis for a five-year feasibility study of a public school system assuming a role in guiding the educational development from birth in Brookline, Massachusetts.

Expansion of definition of education. Congressman Brademas (1972, p. 613), a member on the House Select Education Subcommittee and sponsor of the Comprehensive Child Development Bill, appears to have redefined "early schooling" as "childhood development." He pointed out that his measure "went far beyond providing opportunity for cognitive growth for children."

California's Superintendent of Public Instruction, Riles (1972, pp. 613-14), appears to be employing a similar definition for early schooling. He pointed out that in his mind the key issue of his proposal for the Task Force on Early Childhood Education is not the admission of four-year-olds, but the improved and more effective program for all primary children.

Riles (1972, p. 614) further stated that the goal of the early childhood education proposal is:

> ...by the end of the primary level, all our children will be excited about....Having achieved the skills basic to reading, language, and arithmetic to enable them to proceed successfully with the rest of their school experience.

Basic limitation of research overlooked. R. Moore (1972, pp.

615-21) pointed out that the goals of maximum development of the child are generally sound, but that current research says that California's proposed way for four- or five-year-olds generally to be in school (and even three-year-olds) can only lead to greater trouble. He showed that the central thrust of the California report on ECE is for schooling, defined implicitly as academic education in schools with a specific concern among other things for the advancement of cognitive learning in the young child (Riles, 1971, p. 1). R. Moore further stated that there is a real danger that formal schooling instituting age-inappropriate school-based educational measures outside the home for four- and five-year-olds may be legislated and implemented without scientific research basis, and thereby produce enduring effects which will in turn destroy the very thing that educators encourage: (1) individual cognitive development; (2) the motivation to learn; and (3) the creative impulse.

In relating the results to Early Entrance research, the politicians have overlooked a basic limitation of the research studies cited. The studies have considered Early Entrance to school based on mental age. The politicians seem to have applied the results to the population in general.

Literature Supporting Late Entrance

A comprehensive and impressive amount of research supports late entry to school. The principal studies are those concerned with: (1) relationship of entry age to success; (2) relationship of entry age to reading and language; (3) achievement and adjustment; and (4) relative maturity and vision.

Relationship of entry age to success. One of the early studies of children in matched I.Q. groups was made by Bigelow (1934, pp. 186-92). Children who entered under six years of age were classified as younger, and those who entered at six as older, and repeaters were held in a separate group. The two groups were divided into nine matched groups on a basis of I.Q., and another division of fourteen groups on a basis of mental age. The achievement test administered in the fourth grade in March from which charts were prepared to show the relationship of chronological age, mental age, and I.Q. with success on the test measured as "above standard" and "below standard." She concluded that "a child who is under six years of age both mentally and chronologically has practically no chance of success (1934, p. 189)." Her results compare well with modern studies, even though her findings were not tested statistically. Her predictions included:

1. A child who enters at age 6.0 to 6.4 with an I.Q. of 110 is practically certain to succeed.
2. A child who enters under 6.0 with an I.Q. of 120 will probably succeed.
3. A child who enters under 6.0 with an I.Q. of below 110, and a child who enters at 6.0 to 6.4 with an I.Q. of below 100, will have small chance of success.
4. A child who enters under 6.0 to 6.4 with an I.Q. of 100-109 may have a fair chance of succeeding although each case needs careful study continuously (1934, p. 192).

Relationship of entry age to reading and language. A study of achievement and adjustment of both younger and older kindergarten children at the University of Colorado under the direction of Gott (1936, pp. 1-128) compared 171 kindergarten children who were about four years nine months of age when enrolled with 171 children who were about five years seven or eight months at the time of enrollment. She reported that after six grades of schooling the younger group achieved less well than the older group in all subjects at each grade level (except in one subject at one grade level in which achievement was equal). In regard to reading and language skills, she reported:

> Comparisons of reading readiness scores showed an overwhelming difference in favor of the older children. The difference by age groups was much greater than by sex. All spelling comparisons were statistically significant in favor of the older children (1963, pp. 82-84).

Achievement and adjustment. DeVault (1957, pp. 117-18, 124) studied the relationship of age of early entry to achievement and adjustment. She compared the children in groups set up on bases of chronological age, mental age, I.Q., and sex. Normal age children were those who had entered first grade at six years of age. From a total of 3,572 children tested in grades two, four, and six, 553 underage children were identified. These underage children were classified in four categories: (1) less than one month underage at entrance; (2) one to two months underage; (3) two to three months underage; and (4) over three months underage. The children were tested for skills in reading, arithmetic, total achievement, work-study skills, sociologic status, and personality adjustment. The results indicated that children who were more than two months underage were seldom comparable to achievement of older groups.

Ilika (1963, pp. 118-24) proposed that an early start or entrance into first grade will not result in significant gains of long-term duration on subsequent school achievement. He compared the achievement of early and late entrants to the first grade not only by grade but also at age as they advanced through school. The subjects were divided into three equal groups of 142 early, 142 average, and 142 late entrants. As many as possible were matched according to sex, intelligence, and social class, with the result that 41 pairs of boys and 49 pairs of girls were available for study. He reported his principal findings as follows:

> The comparisons by grade revealed that late entrants consistently attained the higher mean reading achievement ages. Comparisons of the mean spelling ages by grade favored the late entrants without exception. All comparisons of mean total language age by grade favored the late entrants. In general the above findings show that when comparisons were made at age, the early entrants gained an initial slight advantage. However, this advantage tended to erode with advance in age. The results, therefore, tend to support the proposition that an early start will not result in gains of long-term duration (1963, pp. 118-24).

Davis (1952, pp. 40-41) matched two groups of children as to sex, age, intelligence, and home conditions. One group began reading at the age of six, the other at the age of seven. After two years, the late-beginning group caught up with the early-beginning group. At this time, these two groups were joined in classes. At the end of their seventh school year, the children who began a year later were one year ahead of the early beginners. His study showed the following results in reading:

1. Pupils 5 3/4 to 6 years old with 38 percent of low marks;
2. Pupils 6 to 6 1/4 years old with 17 percent of low marks;
3. Pupils 6 1/4 to 6 1/2 years old with 16 percent of low marks; and
4. Pupils 6 1/2 to 6 3/4 years old with 16 percent of low marks.

King (1955, pp. 331-36) reported an Oak Ridge, Tennessee, study of two matched groups of 54 children composed of children who were five years and eight months to five years and eleven months old when they entered school. The second group was composed of children who started first grade at six years and three months to six years and eight months of age. Stanford Achievement Test results at the end of grade six showed a difference, strongly in favor of the older group, which was significant at the .05 level. Eleven of the children were retained. Only one, however, had entered school after six years of age. King also reported nineteen boys and sixteen girls of the younger group appeared to be maladjusted in some way, while only three boys and three girls from the older group were considered maladjusted. Her conclusions were:

> Younger entrants will have difficulty attaining up to grade level in academic skills, and a large portion of them fall far below grade-level standards. Older entrants are more likely to achieve up to and beyond grade level standards. A larger number of the younger entrants will have to repeat a grade (1955, pp. 331-36).

Baer (1958, pp. 17-19) made a similar study of two matched groups of 73 pupils each. The younger group had entered kindergarten at four years nine or ten months, the older group at five years seven or eight months. The groups were compared after eleven years in school. Baer found that after eleven years, the older group had been significantly more successful in maintaining regular progression from grade to grade, with fewer retentions, and no double retention, and two double promotions versus none for the younger group from kindergarten to eighth grade. In secondary school the academic letter grades received by the older group were significantly higher than the younger group. For all personal traits rated by teachers in grades 3 through 8, the older students were rated significantly higher (using t-test at the .01 level) (1958, pp. 17-19).

In 1956, an investigation of matched pairs was made by Carter (1956, pp. 91-103) in Austin, Texas. The legal entrance age for first grade was six years, but many children entered younger by paying tuition. Each pair was studied as to results of achievement tests in grades two through six. It was found that "eighty percent of the underage children do not equal the scholastic achievement of the normal-age children" (1956, p. 103). He concluded that:

> 1. The chronologically older child appears to have the advantage in academic achievement.
>
> 2. In general, the degree of scholastic achievement attained on the first achievement test tends to remain constant throughout the years of elementary schooling.
>
> 3. The underage children making lower scores on the first achievement test did not overcome this inferior postion (1956, p. 102).

Davis provided additional data and came to some conclusions about the fortunes of birth dates:

> Marks of Fair and Poor were considered low. Marks of Excellent and Good were considered high. Ages are as of October 1, 1951.
> A similar study of marks earned by these same children during their kindergarten year showed an even higher precentage of poor marks received by the younger children.
> If your child was born just one day too late and is just unlucky enough to miss entering school this year, the chances are that he is just lucky enough to miss an unhappy school experience and gain a happy one (1952, pp. 140-41).

Hampleman compared early and later starters in the sixth grade for reading achievement in 1959 (1959, pp. 331-34). His study revealed differences that were interesting but not statistically significant. The 58 sixth-grade children in the study were not equated as to I.Q., although the mean and median I.Q. was computed for each age group. The younger group had entered first grade at six years three months or less, and the older at six years four months or more. Subdivisions of the groups were compared for highest and lowest quartiles. Tests in reading in sixth grade showed a mean difference of 4 months, a medium of 7 months, while the comparison of the upper and lower quartiles presented a mean difference of 6.8 months and a median difference of 11 months. This is a dramatic difference in view of the advanced age of the younger group at entrance and was the basis for his conclusion that "children have a considerably better chance for success in reading by starting to school a few months later, rather than a few months' earlier" (1959, p. 334).

Forrester (1955, pp. 80-81) reported a vertical study of 500 grade 1 to 12 school pupils from the Montclair, New Jersey, public schools. Six groups of children classified by chronological age, and six groups by mental age, were studied as they progressed from kindergarten through high school. He reported that the very bright but very young pupils at the time of school entrance did not realize their school success potential, and from junior high on, 50 percent of them earned only "C" grades. The results also indicated that the very bright but older group excelled generally throughout their school careers. The children of the younger group were reported by teachers to be immature physically, emotionally unstable, cried easily, and seldom asked to be leaders.

Other comparisons of reading achievement of early and late entrants at third- through sixth-grade levels that have been reported generally indicate that later entrants significantly excelled those who started earlier. Examples of these studies include (1) Carroll (1964, p. 290) in the third grade; (2) Halliwell and Stein (1964, pp. 631-39, 658) in the fourth and fifth grades; and (3) Green and Simmons (1962, pp. 41-47) in the sixth grade. Similar results were reported by DeWitt 1961, p. 1-27) in grades two through six.

Although a number of these foregoing studies were undertaken with a combination of low and middle SES children, higher SES groups apparently perform similarly. Mawhinney (1964, p. 25) reported how during over a total of 14 summers from 1949 to 1963 children from Detroit's elite Grosse Pointe, Michigan, families were selected by psychologists because they were considered mature enough or of sufficient potential to be admitted to kindergarten before age five. After 14 years an evaluation was made of all who remained in the Gross Pointe schools. More than one-fourth of the selected group were below average or had repeated a grade. He stated:

> Nearly one-third (30.6 percent) of the early entrants were said to be poorly adjusted. Only about one out of 20 (4.6 percent) was judged to be an outstanding leader, while nearly three out of four (74.4 percent) were considered entirely in leadership. Nearly one in four (24.4 percent) was superior academically, and one in four (25.3 percent) was either below average or repeated a grade (1964, p. 25).

These foregoing points of view have been demonstrated for over fifty years, as Reed (1926, pp. 1-98) and Bigelow (1934, pp. 186-92) reported. These researchers and others found that up to 1935, 20 to 40 percent of first grade children were failing because of inability to read. As a consequence of these statistics, Dr. Smith observed that "the reading readiness concept was introduced" (1966, p. 62). This is the concept that California State School Superintendent Riles and other planners now reject (Time, 1971, p. 38). Riles indicated what he meant by "readiness." He was quoted as believing:

> "That state laws barring children from kindergarten until they are nearly five years old derive from the solicitous but outmoded notion of 'readiness.' The idea (readiness) held that it is unwise to shock the young mind with intensive instruction until it is ready--perhaps at age six or seven." The twelve-year curriculum became widespread by the 1890's. Riles adds as "a gift to America to mass education. At a time when relatively few went to college, extra years of school free of charge were indeed a blessing." Now, however, "our youngsters are more ready than our schools are" (Time, 7/26/71, Vol. 98, No. 4, p. 38).

One of the concerns of the early entrance advocates is that all pupils should begin school at the same time so they will be with their peers. Halliwell and Stein (1964, p. 658) aptly pointed out that waiting for readiness doesn't predicate that the child will be overage for his peer group necessarily all the way through his school experiences. After a comprehensive review of the literature Halliwell and Stein indicated that late starting doesn't "in any way negate the value of individualizing programs, or of accelerating pupils through the grades" (1964, p. 658). As there might be a time for acceleration as the able child demonstrates maturity, it should be noted here that provision should be made through non-graded schools to accommodate these differences.

On the other hand, Halliwell and Stein stated these studies "do seem to warrant the conclusion that succumbing to current pressures for an earlier entry date for first grade pupils in extremely difficult to justify especially in view of the very positive findings for other forms of acceleration" (1964, p. 639).

Relative maturity and vision. A provocative longitudinal example of this relative maturity and what happens to children when they are sent to school early was demonstrated by Moselle Boland's report of a scientific paper presented by a Texas ophthalmologist at the 1963 meeting of the Texas Medical Association. The paper was summarized by Moselle Boland as follows:

> Dr. Henry L. Hilgartner said there has been a tremendous increase in nearsightedness in (Texas) school children in the past 30 years ....He blames use of their eyes for close school work at an early age....The constant pull of the eye muscles to do close work, he said, causes the eyeball to become larger. This is the basic defect in nearsightedness....Prior to 1930, he said, 7.7 chilren were farsighted to every one nearsighted....In 1939, Texas compulsory school age was lowered from seven to six years. Today, he added, five children are nearsighted for every one farsighted....

> "I believe the chief cause is children being required to start school at the early age of six instead of being allowed to grow for another year or two. In studying my records, I find that the earlier the children start to school the more frequently nearsightedness is discovered between the ages of 8 to 12," Dr. Hilgartner commented (1963, pp. 3, 5).

In his paper, Hilgartner (1963, p. 4) was more specific. He said:

> I make the charge that most of the morning that the beginner, first grade or kindergarten child, is in the schoolroom he is looking at pictures, making drawings, or watching the teacher draw pictures on the nearby balckboard...he is using all the ocular muscles for accommodation and convergence, in order to see pictures, drawings, etc. If he were outdoors playing robber, soldier, or other games, he would not be using his eyes excessively for close work. The internal and external recti, the superior and inferior recti, as well as the obliques would not be working excessively to make the child see a single object (1963, p. 4).

Newton (1972, pp. 1), an ophthalmologist in Dallas, concurred with Hilgartner. After checking his own records he concluded that Hilgartner's figures were conservative.

Piaget (1966, pp. iv-v) in urging concentration by educators on maximizing a child's development, not on accelerating it found that a child under seven or eight relates quantity to shape and form of objects, but if the shape or form is changed, he becomes confused, assuming the quantity must also change. In relation to vision and maturity, for instance the four- or five-year-old seldom understands how a low, wide glass can hold as much water as a tall, narrow glass. Not until he is seven or eight or older does he become a fully "reason-able" creature, able to reason abstractly instead of dealing solely with direct relationships.

In regard to myopia refraction procedures Tait (1975, pp. 113, 119) has indicated that for children under the age of 4 year olds and upward to 5 to 7 year olds it is unusual for them to give meaningful answers to the usual refractive questions of whether a lens makes the vision better or worse indicating confirmation of the maturational process of the growth and development of the eye indicated by Hilgartner (1963, pp. 3-5), Carter and McGinnis (1970, pp. 51-52), Ilg and Ames (1965, p. 241), and Birch and Lefford (1963, p. 39).

Current Discussion on Early Versus Late Entry

Although there have been advocates of early childhood education (ECE) through the years there has been a significant movement in its support since the early 1960's. Pressures to promote programs for early school admission are seen in the major central thrust for school or academic education for advancement of cognitive learning in the young child in the California State Task Force Report on Early Childhood Education (Riles, 1971; Riles, 1972, pp. 613-14).

In 1963 President Kennedy in his presidential message to Congress pointed out that ECE was one of the Nation's key concerns. The resulting congressional mandates attest to the importance that Congress has placed on ECE (S. White, 1970). President Nixon, too, asked (1) for a national commitment. Possibly, understanding that evidence is not conclusive that generalized early schooling for all is the ultimate solution for optimum child development, he called (2) for a national debate (Moore, 1972, pp. 615-21). Congressional hearings heard calls (1) for more ECE research and (2) for the comprehensive reviewing of completed research reportedly "floating around on some shelf somewhere" (S. White, 1970).

Congressional support for the concepts of the California State Task Force Report on Early Childhood Education was given by Brademas (1972, p. 613) and B. White (1972, p. 612). State support elsewhere is seen in the New York (ECE) program plans for the school to reach earlier into the child's life at ages three, four and five with "formal" planned cognitive educational experiences as routinely would take place in modern schools (Moore and Dorothy N. Moore, 1975, pp. 1-39; Moore and Dennis R. Moore, 1973, pp. 5, 6).

It is noted that current proponents represent the involvement of state and national political influences. The significance of the entry of the politicians into the discussion of early versus late entry to formal education was stressed by the comments of Moore and D. R. Moore (1973, p. 6):

> Most disturbing of all, the volume of research work that stands opposed to early childhood education appears to have made hardly a dent in the enthusiasm of its proponents. The report of the California Task Force in Early Childhood Education, for example, loftily recommends early schooling as a way to prevent future "crime, poverty, addiction, malnutrition and violence"--without pausing to notice that some of the studies it quotes in its support actually contradict its recommendations (1973, p. 6).

The research summarized has provided evidence that early entrance to school by a program of large scale early intervention cannot be accepted as a guarantee that the objectives of reduced crime, drug addiction, poverty, malnutrition, and violence will be realized. There is support in the literature for the premise that later entrance age for school is advantageous. Perhaps, the comments of a writer of a much earlier era are as relevant for the present situation as they were when written in 1865:

> Many children have been ruined for life by urging the intellect and neglecting to strengthen the physical powers. Many have died in childhood because of the course pursued by injudicious parents and school-teachers in forcing their young intellects, by flattery or fear, when they were too young to see the inside of a schoolroom. Their minds have been taxed with lessons when they should not have been called out, but kept back until the physical

> constitution was strong enough to endure mental effort. Small children should be left as free as lambs to run out of doors, to be free and happy, and should be allowed the most favorable opportunities to lay the foundation for sound constitutions (1865, p. 137).

Summary

Research related to the influence of age of school entry upon subsequent speech and language functioning has been reviewed. The concept is developed that formal experience in language skills is ineffective in promoting language maturity unless provided in harmony with the biologic-developmental sequence for the child. This premise provides the framework for outlining six basic concepts. Some corollary concepts also have been developed.

First, the primary concepts developed are as follows:

1. This review of literature has shown that language and speech acquisition is a developmental process that extends into the child's age span of formal education.

2. Research supports the conclusion that reading and writing are tools of language (or language skills) which the child applies after his basic language is developed. Just as acquisition of language is dependent upon maturational processes, so the development of these tools is dependent upon neurologic and neuro-motor development.

3. The reviewed research studies revealed that maturational processes are not adequately developed for the child to succeed in some language functioning until the ages of seven to nine, or older.

4. From the literature reviewed, it seems that there is strong support for the concept that the optimum age for school entry is at least six years, six months, or higher.

5. There is definite evidence that sex differences favoring girls exist in small quantities, and in various variables, but they are not as significant as the variations among early entrants (boys) and late entrants (boys) as a group, and among girls as a group in same fashion.

6. There is research evidence that the developmental myelinization process within the brain is not complete until the child is eight or ten; thus it would infer an ongoing maturational process. Studies on cognition also reveal that the child is not ready for sustained high cortical thought, such abstract thinking as language arts, mathematics, reading, fine arts skills, etc., until after age seven or eight.

The concepts which appear related to the major premises are:

7. Although some evidence is used to indicate or imply that early school entry age is a significant factor influencing subsequent achievement in speech and language, the evidence tends to indicate that the later entrants excel early entrants in language arts development. The differences have been noted from kindergarten through the eighth grade, and into the secondary school grades.

8. The evidence reviewed favors the home as the optimum early childhood environment.

9. The literature suggests that there is a reason to believe that anxiety and early stress are linked to the loss of motivation incurred in part when a child is prematurely enrolled in school.

10. There is evidence in the research reviewed to show that too much schooling too early may result in damage to the child physically, mentally, and even emotionally. The evidence also suggests that the brighter the child, the greater the risk.

11. In summary, research comparisons of school entry ages point to the need (1) to delay any type of instructional program that proposes or allows sustained high cortical effort, or strain on the visual or auditory systems, before the child is seven or eight, and for (2) a warm, continuous mother or mother-surrogate relationship (contraindicating a succession of different people) until the child is at least seven or eight years of age.

CHAPTER III

MATERIALS AND PROCEDURES

This chapter is concerned with: (1) the description of the techniques employed in the selection of subjects and collection of data; (2) the identification of materials and diagnostic instruments used; (3) the presentation of data describing the two groups studied; (4) the description of procedures used for analysis of the data; and (5) the statements of null hypotheses are presented also in the present chapter.

Independent Variable Data

Selection of Subjects

Thirty subjects, fifteen in each group, were selected for the present investigation by following a three stage elimination and matching process. Initially, subjects were identified who met the entry age criteria for the study. This was accomplished by use of a questionnaire sent to parents of all children in grades four through eight which questioned age of entry to first grade, and whether or not the child had pre-school and/or kindergarten experience.

On the bases of the responses to these questionnaires two tentative groups of subjects were identified. One group, the "Early Entrants" group, was composed of children who were six years, three months or less at the time of entry to first grade. The second group, the "Late Entrants" group, was composed of children who were six years, eleven months or older when they entered first grade.

The second stage of the selection-elimination process resulted in the elimination of subjects who did not meet several criteria in addition to the age of school entry criteria. The criteria employed were: (1) continuous enrollment in one of the schools of the private school system from which subjects were drawn; (2) absence of non-corrected or uncorrectable visual impairment, organic speech defect, hearing impairment, severe emotional problems, or extreme poverty; (3) school records indicated a non-language intelligence quotient on the California Test of Mental Maturity (Short Form Test of Academic Aptitude) of 75 or more; and (4) in the case of Early Entrants, had participated in a preschool or kindergarten experience.

From the questionnaires (Appendix A) students were identified who satisfied criteria one, two, and four listed above. The final portion of the second stage of the matching-elimination process was that of determining the extent to which they satisfied the non-verbal I.Q. criteria. Schools from which subjects of study were drawn routinely administer the California Test of Mental Maturity (Short Form Test of Academic Aptitude) in fourth and seventh grades. The CTMM provides both language and non-language scores. For selecting subjects for the present study, non-language scores of the most recent CTMM (Short Form Test of Academic Aptitude) were used. The use of the language scores to provide measures of language function is described in the section dealing with the dependent variables.

The information needed for matching on the basis of sex, grade, non-language I.Q., and socio-economic status was obtained from the subject's cumulative record.

Socio-economic status (SES) was estimated by use of the scale developed by Warner et al (1960, pp. 140-1). (See Scale in Appendix I). The parent's occupation was obtained from each subject's cumulative record. The occupational title of the father was then verified with the teacher and by questioning the subject. Each subject was then rated according to the scale developed by Warner et al (Appendix III: Tables 1, 2, and 8).

In the third stage of the selection-elimination process, the final group of subjects met all of the criteria described. The subjects for the two groups were then matched on the basis of sex, grade, non-language I.Q., and (as closely as feasible) socio-economic status.

Fifteen subjects were selected for each of the two groups of the investigation. The general description of the two groups is summarized in Table 83.

Dependent Variable Measures and Methods

The dependent variables of this investigation fall into seven categories. The categories are identified as follows: (1) CTMM Short Form Test of Academic Aptitude; (2) Gilmore Oral Reading Test; (3) Templin-Darley Screening Test of Articulation; (4) inflection of American English speech; (5) vowel production; (6) general language development; and (7) picture story language test of written language. The instruments for securing data on the dependent variables considered and the methods employed are as follows:

CTMM Short Form Test of Academic Aptitude

As previously indicated, the CTMM Short Form scores were obtained from the guidance records of each subject involved in the present study. Scores for the six subtests which constitute the language portion of the CTMM were analyzed as dependent data.

The subtest scores used were: (1) mechanics of English language; (2) expression of English language; (3) spelling; (4) total general language development; (5) silent reading vocabulary; and (6) silent reading comprehension.

Gilmore Oral Reading Test

Oral reading is an advanced language skill. It was felt it would provide a means for supplementing measures of language development given by other diagnostic instruments. The Gilmore reading test was selected because the measures obtained included oral reading accuracy, comprehension, and reading rate.

Templin-Darley Screening Test of Articulation

Articulation accuracy is another dimension of language maturation. The Templin-Darley Screening Test of Articulation (1960, pp. 1-5) was selected as the measure of articulation performance. A measure of the accuracy of consonant articulation was obtained for each subject. The measure used consisted of an error score based on ratings of accuracy of production of 50 consonant and consonant clusters of the Templin-Darley screen test (1960, pp. 1-57). This screening test was employed because it permitted use of recorded speech signals obtained in conjunction with other aspects of the study.

Inflection of American English speech

Two measures of inflection were used. One measure of inflection was obtained from ratings of recorded samples of speech. A five point rating scale of quality of inflection was used. The scale used ranged from "1" for extremely good or outstanding inflection to "5" for very poor inflection. The inflection scores used were the sum of the ratings given by twelve trained judges.

The second measure of speech inflection consisted of a rating given by each subject's teacher responsible for speech and language arts instruction. The teachers were instructed to use the same five point scale used by the trained judges.

Acceptability of vowel production

A measure of the acceptability of vowel production was obtained from ratings of a recorded speech sample of a sentence which contained a large number of vowels and diphthongs. The ratings were made of the vowels and diphthongs / O /; / u /; / ɑ /; / U /; / ɛ /; / ɑu /; / æ /; / eI /; / I /; / ə /; / ɔ /; / ɚ /. A three point rating scale of acceptability of vowel production was used. The scale used ranged from "2" for unacceptable to "3" for acceptable with an intermediate rating of "2.5" for not sure. The vowel production acceptability scores used were the sum of the ratings given by twelve trained judges.

General language development

A measure of general language development consisted of a rating given by each subject's classroom teacher responsible for language arts instruction. The teachers were requested to indicate a language judgment by a subjective impression of the subject's use of language from a spontaneous language sample obtained previously for the speech specialist's ratings. They were told to use a five point scale they used for the ratings of inflection. Before indicating their final judgment, the teachers were asked to consider observed aspects and facets of language such as the subject's use of grammar, syntax, spelling, written language, and creativity in expression of ideas.

Picture story language test of written language

Measures of language function based on spontaneous written language were obtained for each subject. The Picture Story Language Test (PSLT) (Myklebust, 1965) was selected for several reasons. An important consideration in the selection of the PSLT was that age percentile scores are provided for the range of ages of the subjects of the study. It was also felt that the populations described for the standardization norm for the test were comparable to the populations from which the subjects for this study were drawn.

Three specific measures of language function were obtained from the PLST. The measures obtained were: (1) productivity-length; (2) syntax-correctness; and (3) abstract-concrete-content or meaning.

Procedures for Obtaining Data

The procedure for obtaining both independent and dependent variables consisted of: (1) testing subjects and recording speech samples; (2) description of test administration; (3) test procedures; (4) preparation of recorded samples for judging; (5) judging of recorded samples of (a) consonant articulation, (b) inflection of American English speech, and (c) vowel production; (6) teacher ratings of inflection and language; and (7) scoring of PSLT (Picture Story Language Test).

Testing subjects and recording speech samples

An advanced graduate student in speech pathology and audiology served as test administrator for both the Gilmore Oral Reading Test

(GORT) and the Picture Story Language Test (PSLT). The test administrator was briefed for the tasks by the investigator, the directors of the reading and communication department centers of Loma Linda University, as well as the administrator of each school involved in the study.

The tests were administered in a quiet room in the child's school. There was no special acoustical treatment for the rooms. After informal instructions were given to each subject, the tests were administered to each subject individually. The order of testing followed was: (1) the GORT first; and then (2) the PSLT. The tests were administered in accordance with the directions provided. The results of the GORT were recorded according to the directions given before another subject was tested. The PSLT was scored at a later time.

After each subject completed the PSLT, two recorded speech samples were obtained. The first sample was obtained by having the subject read aloud from the paragraph he/she had written for the PSLT. The second sample for vowel production ratings consisted of the subject's repeating the sentence: "Joe took father's shoe bench out and laid it on the lawn." The subject said the sentence two times.

Test administration and procedures

The following tests were administered to the subjects: (1) Gilmore Oral Reading Test (GORT); and (2) Picture Story Language Test (PSLT).

For the oral reading measure procedure in the study, the directions from the Manual of Directions: Gilmore Oral Reading Test were followed. The subject was directed to begin reading aloud normally that paragraph which is two paragraphs below the pupil's grade level. Then he read each succeeding passage until he had made ten or more errors on one paragraph. The ceiling level--the level of the paragraph on which ten errors were made--was recorded.

A stop watch was used to determine the number of seconds it took the subject to read the paragraph passage. The time in seconds and the number of errors were recorded in the Examiner's Record Booklet in accordance with the directions provided.

At the conclusion of the administration of the oral reading test, the ceiling level and time were recorded. Grade equivalent, performance rating, and stanine scores were then determined from the tables provided and recorded.

For the measure of written language, the PSLT was administered to the subjects. The directions in the Development and Disorders of Written Language, Volume One, Picture Story Language Test (Myklebust, 1965, pp. 92-3) were followed. When all arrangements had been made, the examiner's instructions were given orally as follows: "Look at this picture carefully." After a pause of about 20 seconds, the examiner said, "You are to write a story about it. You may look at it as much and as often as you care to. Be sure to write the best story you can. Begin writing whenever you are ready." The picture was then placed in a central position where it could be seen easily. Thereafter, the examiner remained present and available, but in the background. The object of the effort is to secure the best sample of written language of which the individual is capable even if it is only a few poorly produced words or phrases (Myklebust, 1965, pp. 92-3). The sample was scored and recorded on the test record form in accordance with the directions provided (Myklebust, 1965, pp. 95-146).

At the conclusion of the administration of the test when the subject had completed the story, the subject was asked to read the story aloud at which time a tape recording was obtained.

Preparation of recorded samples for judging

The two recorded speech samples obtained for each subject, as explained previously, were numbered with the code numbers previously assigned each subject for purposes of identification for ease in the computerized analysis. No name was attached to any speech sample. Then by use of a table of random numbers, the selection order was determined on which the samples were compiled on the two judging tape recordings: (1) inflection and consonant articulation; and (2) vowel production sentence. On each of the two judging recordings, the speech samples were dubbed by use of two Sony cassette recorders (Model TC-55).

Judging of recorded speech samples

The speech samples were judged in two separate judging sessions on two different campuses of Loma Linda University by two groups of judges characterized by the factor of experience as follows: (1) group one, seven judges (advanced graduate students) with more clinical experience in speech evaluations; and (2) group two, five judges (seniors) with less clinical experience.

At each of the two judging sessions, the judges completed their judging tasks for all three variables: (1) inflection; (2) consonant articulation; and (3) vowel and diphthong production.

For rating purposes, the judges were in a quiet room with no special acoustic treatment. The recordings were played on a Sony cassette recorder (Model TC-55) to the judges. All judges were seated between five to eight feet from the recorder. A volume level that was considered comfortable for all judges was used. The judges recorded their judgments.

The recording of paragraph samples was played for the judges twice: first, for their ratings of the subject's inflection; and second, for their ratings of the subject's articulation errors. The recording of the single sentence samples was played for the judges for their ratings of the subject's vowels and diphthongs production acceptability.

Each judge was provided with a rating sheet (Appendix A) for recording his ratings of inflection. The judge recorded his rating by placing a check mark or an "X" in the appropriate box on the rating sheet.

After instructions for judging inflection were given and a suitable practice period, the samples were presented to the judges. The paragraphs were rated on a five point scale with the number "1" indicating the most acceptable inflection. The instructions which were given to the judges both orally and in writing were as follows:

"All of the speakers are either 4th, 5th, 7th, or 8th grade students. Listen to each sample of speech for each subject. Rate it as to the quality of inflection as typifies good general American speech. If the speech sample is only average, rate it '3'. If it is above average, rate it '2'. If it is below average, rate it '4'. If it is extremely good or outstanding, rate it '1'. If it is very poor, rate it '5'. The speakers will be grouped according to grade levels, and their individual numbers will be announced preceding each sample of recorded speech."

The ratings of each judge were recorded, as were each subject's total ratings by all judges (total scores). Inasmuch as seven of the judges had more experience in speech evaluations of early childhood, and elementary and junior high school children than the other five seniors, it was deemed important in the present study to calculate reliability between the two groups of therapists categorized by the factor of experience with children in a school setting. There was no significant difference between the two groups (Table 45).

A reliability study of the ratings of inflection indicated that there was no significant difference between the two groups of raters, i.e., more experienced and less experienced; and no difference between raters, i.e., they were consistent from one to another and from group to group. The results of the analysis are shown in Table 45.

On the second playing of the same paragraph recording, the judges were instructed to listen for errors of consonant articulation. Special emphasis was to be given to the fifty items of the Templin-Darley Screening Test of Articulation (1960, pp. 1-57). The fifty items were reviewed to be sure that the judges were attending to the proper consonant items for errors. While the recording was played, the judges transcribed in phonetic characters the articulation errors noted. The total number of articulation errors report by each judge constituted the total articulation error score for that judge.

Only five of the thirty subjects made consonant errors, and these errors were limited to approximately one consonant per child at the most. It is not possible on the basis of the number of errors to make a statement regarding inter-judge reliability for articulation error judgments.

After the judges had completed the ratings of articulation errors. the judging of the sentence tape recordings for vowel and diphthong production was played. Then instructions were given for performing the vowel rating tasks on three point scale of 2, 2.5, or 3, with number "3" indicating the highest or best rating of vowel and diphthong production acceptability for each subject. The instructions, which were given orally and in writing, were as follows:

"All of the speakers are either 4th, 5th, 7th, or 8th grade students. Listen to each sample of speech. Rate the vowels and diphthongs as to the acceptability of vowel production as typifies good American English speech. If the vowel or diphthong is acceptable, rate it '3'. If it is not acceptable, rate it '2'. If you are uncertain whether it is acceptable or unacceptable after listening to the vowel or diphthong a second time, rate it '2.5' (an intermediate rating between '3' and '2' ratings). The speakers are grouped according to grade levels, and their individual numbers will be announced preceding each sample of recorded sentences."

After the judges had been given the instructions, a short practice period was provided, and then the vowel and diphthong sentence judging tape recording was played. The judges reported their rating of the subject's vowel production according to the directions on the form provided (Appendix A).

The data would indicate that there were not significant differences for vowel production between the two groups of raters, i.e., more experienced and less experienced; and among judges, i.e., they were consistent from one to another, and from group to group. The results are shown in Tables 62-74, and 82.

Classroom teacher ratings

Two measures of inflection and general language arts development were obtained from ratings by the subject's classroom teacher responsible for speech and language arts instruction. For the first measure of inflection, the classroom teacher was instructed to use the same five point scale used by the twelve trained judges. Since the child's teacher had more experience in the broad field of speech arts and language, albeit less technical knowledge, training, and experience in clinical evaluations in the field of speech pathology, the teacher was asked to rate the subject from personal observation of his general spontaneous speech in the school environment.

For the second measure of general language arts development, the classroom teacher was asked to rate the subject's ability in language arts development in relation to his peers with the same non-language I.Q. ability in his class. The teacher then rated the pupil on a five point scale, with the number "1" indicating the highest rating. The instructions which were given to the teachers orally by the school administrator, and in writing, were as follows:

"Since this student is in your language arts class, review the information you have about the student's ability in general language arts development in comparison with other classmates with the same non-language I.Q. Then rate him as to his overall general language development in American English language as objectively as possible. If the pupil is only average, rate him '3'. If he is above average, rate him '2'. If he is below average, rate him '4'. If he is extremely good or outstanding, rate him '1'. If he is very poor, rate him '5'."

The ratings of each teacher were recorded, as were the total ratings by all teacher judges (total scores for both the early and the late entry groups).

Scoring the Picture Story Language Test

The measure of written language (PSLT) (Myklebust, 1965) was scored by the graduate student who administered the test. The directions for scoring the PSLT (Myklebust, 1965, pp. 95-146, 162-272) were followed.

After the test was scored the age equivalent, percentile scores, and stanine ranks were obtained for the analysis of variance of this study.

Statistical Techniques

The hypotheses of this investigation were tested by use of various analyses of variance designs.

A two x fifteen, fix x fixed, groups x matched subjects one-way analysis of variance with one observation by cell was made. In the analysis each of the results of the measures of linguistic functions comparing the two groups of early and late entrants to first grade was tested.

A one-way analysis of variance was made to determine if the two groups differed significantly in inflection of American English speech. The analysis indicated the average ranks of raters, i.e., raters weighted equally.

A one-way analysis of variance was made of the average ranks weighted equally of all linguistic variables. This allowed for overall differentiating between the two groups for significance.

For the further analysis of inflection of American English speech, general language development, and the treatment of the findings of vowel production, a thirty x twelve, fix x fixed matched subjects x experimenters one-way analysis of variance was made. This analysis with subjects nested under groups, and with experimenters nested under experience of experimenter, was made to complete the statistical analyses.

The null hypothesis was rejected in each case in which the ratio was significant at the .05 level.

The data processing report of the raw data and the statistical analyses is presented in Tables 1-82 in the Appendices "B," "C," and "D."

Hypotheses regarding achievement results in mechanics of English language, expression of English language, spelling, and reading

1. There are no significant mean differences between the E-E and L-E groups in mechanics of English language for fourth, fifth, seventh, and eighth grade children.

2. There are no significant mean differences between the E-E and L-E groups in expression of English language for fourth, fifth, seventh, and eighth grade children.

3. There are no significant mean differences between the E-E and L-E groups in spelling for fourth, fifth, seventh, and eighth grade children.

4. There are no significant mean differences between the E-E and L-E groups in total general language development for fourth, fifth, seventh, and eighth grade children.

5. There are no significant mean differences between the E-E and L-E groups in silent reading vocabulary for fourth, fifth, seventh, and eighth grade children.

6. There are no significant mean differences between the E-E and L-E groups in silent reading comprehension for fourth, fifth, seventh,

and eighth grade children.

7. There are no significant mean differences between the E-E and L-E groups in total silent reading skills for fourth, fifth, seventh, and eighth grade children.

8. There are no significant mean differences between the E-E and L-E groups in combined general language arts achievement (total mechanics of English language, expression of English language, spelling, total general language development, silent reading vocabulary, silent reading comprehension, and total silent reading skills) for fourth, fifth, seventh, and eighth grade children.

9. There are no significant mean differences between the E-E and L-E groups in oral reading accuracy for fourth, fifth, seventh, and eighth grade children.

10. There are no significant mean differences between the E-E and L-E groups in oral reading comprehension for fourth, fifth, seventh, and eighth grade children.

11. There are no significant mean differences between the E-E and L-E group in oral reading rate for fourth, fifth, seventh, and eighth grade children.

12. There are no significant mean differences between the E-E and L-E groups in total oral reading skills (oral reading accuracy, oral reading comprehension, and rate) for fourth, fifth, seventh, and eighth grade children.

Hypotheses concerning achievement in consonant articulation, inflection, and general language arts ratings

13. There are no significant mean differences between the E-E and L-E groups in the frequency of errors in English consonant articulation

for fourth, fifth, seventh, and eighth grade children.

14. There are no significant mean differences between the E-E and L-E groups in the inflection of American English speech for fourth, fifth, seventh, and eighth grade children.

15. There are no significant mean differences between the E-E and L-E groups in general language arts achievement ratings for fourth, fifth, seventh, and eighth grade children.

Hypotheses regarding production of vowels

16. to 27. There are no significant mean differences between the E-E and L-E groups in the vowel production of: the vowel / o /, in the word "Joe;" the vowel / U /, in the word "took;" the vowel / ɑ /, in the word "father's;" the vowel / ɚ /, in the word "father's;" the vowel / u /, in the word "shoe;" the vowel / ɛ /, in the word "bench;" the diphthong / ɑU /, in the word "out;" the vowel / æ /, in the word "and;" the diphthong / eI /, in the word "laid;" the vowel / I /, in the word "it;" the vowel / ə /, in the word "the;" the vowel / ɔ /, in the word "lawn" for fourth, fifth, seventh, and eighth grade children.

Hypotheses concerning achievement results in written language in areas of verbal behavior: productivity, syntax, and abstract-concrete

28. There are no significant mean differences between the E-E and L-E groups in productivity in written language for total words for fourth, fifth, seventh, and eighth grade children.

29. There are no significant mean differences between the E-E and L-E groups in productivity in written language for total sentences for fourth, fifth, seventh, and eighth grade children.

30. There are no significant mean differences between the E-E and

L-E groups in productivity in written language for words per sentence for fourth, fifth, seventh, and eighth grade children.

31. There are no significant mean differences between the E-E and L-E groups in syntax, in written language, for fourth, fifth, seventh, and eighth grade children.

32. There are no significant mean differences between the E-E and L-E groups in abstract-concrete area in written language for fourth, fifth, seventh, and eighth grade children.

CHAPTER IV

RESULTS OF THE STUDY

Analysis of variance of data derived from two groups of subjects were performed to investigate dimensions of language development. The analysis of variance results are presented in detail in Tables 9 to 82 of Appendices III, IV, and V.

The results of the study are summarized in this chapter for each of the variables considered. The variables studied and the numbers of the Tables which present the related results are as follows:

1. Mechanics of English language (Tables 9, 10, and 77).
2. Expression of English language (Tables 11, 12, and 77).
3. Spelling (Tables 13, 14, and 77).
4. Total general language development (Tables 15, 16, and 77).
5. Silent reading vocabulary (Tables 17, 18, and 77).
6. Silent reading comprehension (Tables 19, 20, and 77).
7. Total silent reading skills (Tables 21, 22, and 77).
8. Combined general language arts achievement (Tables 23, 24, and 77).
9. Oral reading accuracy (Tables 25, 26, 27, and 78).
10. Oral reading comprehension (Tables 28, 29, 30, and 78).
11. Oral reading rate (Tables 31, 35, 36, and 78).
12. Total oral reading skills (Tables 32, 33, 34, and 78).

13. Consonant articulation in English (Tables 37, 38, 39, and 80).

14. Inflection (Tables 40, 42, 43, 44, 45, 75, and 81).

15. General language arts achievement ratings (Tables 41, 61, and 81).

16. Vowel production (Tables 62 to 74, and 82).

17. Written language productivity (Tables 46 to 54, and 79).

18. Written language syntax quotient (Tables 54 to 57, and 79).

19. Written abstract-concrete language (Tables 58 to 60, and 79).

Data from two groups of subjects were compared. The groups of subjects were: (1) Early Entrants (E-E) - composed of children who were six years three months, or less, at the time they entered first grade; and (2) Late Entrants (L-E) - composed of children who were six years eleven months, or older, when they entered first grade.

Independent Variable Data

For non-language I.Q., chronological age, and socio-economic status, a two x fifteen, fix x fixed, groups x matched subjects one-way analysis of variance with one observation by cell was made among the two groups of early and late entrants to first grade of fifteen subjects each. The results are summarized in Tables 3 and 8 and have been discussed in Chapter III.

The Results of the Dependent Variables

Mechanics of English Language

There was a significant difference between the groups in mean

CTB/CTMM Short Form Test of Academic Aptitude scores for mechanics of English language (Tables 9 and 10). The E-E group mean was lower than that of the L-E group mean score.

Expression of English Language

Mean scores for the CTB/CTMM Short Form Test of Academic Aptitude scores for Expression of English language are shown in Tables 11, 12, and 77. The scores obtained for the E-E group were 5.3 and 45.1, and the scores for the L-E group were 8.7 and 77.0 respectively. The differences were significant.

Spelling

The mean CTB/CTMM Short Form Test of Academic Aptitude grade equivalent score in the area of spelling was 6.7 for the E-E group and 7.8 for the L-E group (Tables 13, 14, and 77), although the F ratio was not significant. The E-E group national percentile mean was 42.0, and that of the L-E group was 56.6. This difference also was not significant.

Total General Language Development

The two groups were significantly different in mean scores of general language development (a score based upon mechanics of English language, expression of English language, and spelling scores of the CTB/CTMM Short Form Test of Academic Aptitude). The total grade equivalent subtest for the E-E group was 5.1 and the L-E group 7.5 (Tables 15, 16, and 77). The national percentile for the two groups were 42.8 and 67.5 respectively. The F ratios indicate that the TLGD score for the L-E group was significantly greater than the TLGD score for the E-E group.

Silent Reading Vocabulary

Mean grade equivalent scores on the CTB/CTMM Short Form Test of Academic Aptitude for silent reading vocabulary are shown in Tables 17, 18, and 77. The mean for the E-E group was 5.2 and that for the L-E group 6.3. The F ratio was significant.

Silent Reading Comprehension

CTB/CTMM Short Form Test of Academic Aptitude mean scores for the area of silent reading comprehension demonstrated significant differences between the L-E and the E-E groups (Tables 19, 20, and 77).

Total Silent Reading Skills

Scores in silent reading vocabulary and silent reading comprehension were totaled for each subject. The E-E group was lower than the L-E group in mean total scores, and the difference was significant (Tables 21, 22, and 77).

Combined General Language Arts Achievement

The two groups differed significantly in mean scores of general language arts development, mechanics of English language scores, plus expression of English language scores, plus spelling scores, plus total reading scores. The E-E group was lower than the L-E group. The F ratio was significant (Tables 23 and 24).

Oral Reading Accuracy

In oral reading accuracy scores from the Gilmore Oral Reading Test, the two groups did not differ significantly in total stanine scores (Tables 25 and 78), grade equivalent (Tables 26 and 78), and performance rating scores (Tables 27 and 78). The E-E group was lower than the L-E group.

Oral Reading Comprehension

Findings from the oral reading comprehension mean stanine and grade equivalent total scores on the Gilmore Oral Reading Test were similar to those for accuracy (Tables 28, 29, 30, and 78). That is, the means for the L-E were greater than the E-E, but the differences were not significant.

Mean reading comprehension performance rating from the test described above, the two groups did differ significantly. The E-E group was 2.5 and the L-E group was 3.3. The F ratio was significant (Tables 30 and 78).

Oral Reading Rate

The mean stanines for oral reading rate from the Gilmore Oral Reading Test were significantly different for the two groups (Tables 31 and 78). The mean stanines for the E-E group was 1.4, and 2.2 for the L-E group. The F ratio was significant.

There was no significant difference in the mean words per minute (WPM) (Tables 35 and 78). The E-E group was lower than the L-E group in mean rate.

The two groups were significantly different in mean performance ratings (Tables 36 and 78). The mean performance rating for the E-E group was 2.2, and for the L-E group the mean was 3.0.

Total Oral Reading Skills

The Gilmore Oral Reading Test scores in oral accuracy, oral comprehension, and oral rate were totaled for each subject to give a total stanine score, grade equivalent, and performance rating. The mean total stanine for the E-E group was lower than the L-E group, but the F ratio was not significant (Table 32). Means of the total grade equivalents also were not significantly different (Table 33). There was a significant difference between the means for the total performance ratings. The mean total performance ratings for the L-E group (8.9) was significantly greater than the mean for the E-E group (7.0) (Table 34, see also Table 78).

Consonant Articulation

The results from the screen-testing of articulation of two speech samples using the Templin-Darley Screening Test of Articulation as a guide revealed a total of 51 errors for the E-E group and 22 errors for the L-E group (Table 39). Thirty-two of the errors for the E-E group subjects were substitutions, and 19 were distortions. Eleven errors for the L-E group subjects were substitutions, and 11 were distortions.

Although the L-E group was found to have fewer errors than the E-E group (Tables 37, 38, 39, and 80), the F ratio was not significant.

Inflection

There was a significant difference between the two groups in mean total scores of inflection of voice as rated by the thirteen judges. The mean inflection for the L-E group was 22.5 (Tables 43 and

81). The F ratio was significant. Also the E-E group was significantly inferior to the L-E group in mean total rank scores (Tables 44 and 81).

There was a significant difference between the means of the inflection ratings made by each subject's teacher of the language arts curriculum in the classroom (Tables 40 and 81). The L-E group received the better rating (1.2 versus E-E 3.0).

Written Language - Productivity

The analyses of the total word measures of the Picture Story Language Test (PSLT) are shown in Tables 46, 47, and 48. The results show that there were no significant differences between the two groups for age equivalent, percentile, or stanine measures. The L-E group placed higher than the E-E group on the age equivalent and stanine measures. The E-E group placed higher on the percentile measure.

The analyses of the _total sentences_ measure of the PSLT are shown in Tables 49, 50, 51, and 79. The results show that there were no significant differences between the two groups for age equivalent, percentile, or stanine measures, although the L-E group placed higher than the E-E group on all measures.

For _words per sentence_ measure of the PSLT, the analyses are shown in Tables 52, 53, 54, and 79. The results show that there were no significant differences between the two groups for age equivalent, percentile, or stanine measures. The L-E group placed higher than the E-E group on all measures.

Written Language - Syntax Quotient

The age equivalent and percentile measures of the syntax-quotient of the Picture Story Language Test (PSLT) were significantly higher for the L-E group (A.E. = 16.0, percentile = 59.4) than for the E-E group (A.E. = 10.7, percentile = 34.5) (Tables 55, 56, and 79). The groups were not significantly different on the stanine measure (Tables 57 and 79). Again the measures for the L-E group were higher than for the E-E group.

Written Language - Abstract - Concrete

Total mean scores for the concrete abstract scale of the Picture Story Language Test (PSLT) were not significantly different for the two groups for any of the following measures computed (Table 79): (1) age equivalent (Table 58); (2) percentile (Table 59); (3) stanine (Table 60). The L-E group placed higher for the age equivalent measure. The E-E group ranked higher on the stanine and percentile measures.

General Language Development Ability and Achievement

There was a significant difference between the two groups in mean total scores as rated by each subject's teacher of language arts curriculum in the classroom for general language development achievement and ability (Tables 41 and 81). The L-E group was accorded the better rating superior to the E-E group. The F ratio was significant.

Vowel Ratings

The results indicate that there were no significant differences between the two groups for the ratings of ten vowels and two diphthongs (Tables 62 to 74, and 82).

Summary

The two groups of private-school children, Early Entrants (E-E) and Late Entrants (L-E), were subjected to a comparison in certain areas of language development. Each of the two groups consisted of six boys and nine girls. Each group had seven middle grade (4th-5th) subjects and eight upper grade (7th-8th) subjects (Tables 1 and 2).

Analyses of variance revealed no significant difference between the groups in non-language I.Q. or socio-economic status rating.

The two groups were compared in all areas by the method of a one-way analysis of variance. In every instance in which the F ratio was significant at .05, the significance was ascertained and noted.

There were significant differences between the groups in the following criterion variables:

1. Mechanics of English language
2. Expression of English language
4. Total general language development
5. Silent reading vocabulary
6. Silent reading comprehension
7. Total silent reading skills
8. Combined general language arts achievement
9. Oral reading comprehension (performance rating)
10. Oral reading rate (stanine and performance rating)
11. Total oral reading skills (performance rating)
12. Inflection

13-14. Written language syntax quotient (age equivalent and percentile)

15. General language development, ability, and achievement rating

16. Overall appraisal of language functioning

Analyses indicated that in each of the above areas, the L-E group surpassed the E-E group.

In vocal inflection in two repeated analyses of variance, there were significant differences between groups. When a one-way analysis of variance was made with ranks of raters (i.e. weighted equally), there was a significant difference between the L-E and the E-E groups. The E-E group was significantly inferior to the L-E group.

Also there were significant differences between groups in inflection when a one-way analysis of variance was made with subjects nested under groups and raters nested under experience. Here again the L-E group was accorded the better rating and significantly differed from the E-E group.

Likewise there were significant differences between groups when a one-way analysis of variance was made of the average ranks weighted equally of all the linguistic variables. The two groups differed significantly with the L-E group surpassing the E-E group.

There were no significant differences between groups in the following criterion variables:

3. Spelling

9. Oral reading accuracy

13. Consonant articulation

10. Oral reading comprehension (grade equivalent and stanines)

11. Oral reading rate (WPM)

12. Total oral reading skills (stanine and grade equivalent)

17. Written language productivity

19. Written language - abstract-concrete language

16. Ratings of vowel production

Vowel production ratings were made of ten vowels and two diphthongs spoken by the two groups of subjects. The ratings were made by twelve rater-judges who were almost equally divided by the factor of experience with children of the early childhood and elementary school age periods. Mean differences between groups were compared by analyses of variance with subjects nested under groups and raters under experience.

The analyses of variance indicated there were no significant mean differences between groups for the vowels' total ratings of acceptability made by the twelve judges.

CHAPTER V

DISCUSSION OF RESULTS

The concept was developed in Chapter II that formal experience in language skills was ineffective in promoting language maturity unless provided in harmony with the biologic-development sequence for the child. The availability of two groups of children--(1) one of children who began formal first grade experience at less than six years of age (Early Entrants, E-E); and (2) a second composed of children who began first grade after they were over six years, eleven months of age (Late Entrants, L-E)--provided an opportunity to test the basic concept.

Summary of the Results Supporting the Basic Hypothesis

The analyses of the data obtained indicate that the L-E group scored significantly higher than the E-E group for eight variables: silent reading vocabulary and comprehension, oral reading rate and comprehension, total oral reading skills, mechanics and expression of English language, and written language syntax quotient. These results are interpreted as supporting the basic hypothesis of this research.

The results obtained showed that the L-E group was consistently higher than the E-E group. It is felt that the findings are consistent with the basic hypothesis, although four of the variables studied (spelling, oral reading accuracy, written language productivity, and abstract-concrete written language) do not give support at the level of significance.

Further support for the hypothesis of this investigation is seen in the analysis of rank order of mean scores of all variables as shown in Table 61. The results of the ranked difference analysis indicated that the L-E scored higher than the E-E for a larger number of variables. The results of this analysis were significant. This significant analysis of ranked differences is considered as further evidence in support of the basic hypothesis of this study.

A better understanding of the implication of the results is seen when consideration is given to a comparison of results in which significant differences were obtained. There were fourteen variables for which significant differences were noted: mechanics of English language, expression of English language, total general language development, silent reading vocabulary, silent reading comprehension, total silent reading skills, combined general language arts achievement, oral reading comprehension (performance rating), oral reading rate (stanine and performance rating), total oral reading skills (performance rating), inflection, written language syntax quotient (age equivalent and percentile), general language development ability and achievement ratings, and overall appraisal of language functioning.

On the other hand, the following nine variables were not significant: spelling, oral reading accuracy, consonant articulation, oral reading comprehension (grade equivalent and stanines), oral reading rate (words per minute), total oral reading skills (stanine and grade equivalent), written language productivity, written language (abstract-concrete), and ratings of vowel production.

A critical analysis of the nature of the various sub-tests indicates that those which showed a significant difference are those which would be described as sub-tests related to language competencies. Although written language--abstract-concrete and productivity, oral reading comprehension (grade equivalent and stanines), and total oral reading skills (stanine and grade quivalent)--would reflect language competency, the remaining five variables which were not significantly different for the two groups were clearly language performance variables.

The observation that the variables for which there were significant differences consisted of competence items is interpreted by this author as providing further support for the basic premise of this study. The performance skills variables may be mastered by drill and are not as sequentially dependent as are factors contributing to language competence.

The proponents of early education offer that exposure to language skills during this early age period of time really will enable these Early Entrants to make long-term lasting gains. Under those conditions, it would seem that exposure to language skills at five years of age in first grade might show up as an advantage later on. When these children progress to a later time period, one would then find them as good as, or perhaps better than, their grade peers who started much later. This proposition appears to be based on the contention of the early education proponents: (1) that readiness of the child physically, mentally, and emotionally is an outmoded concept in education; and (2) that maturation does not play an important role in language development.

The results of the present study do not support the above-described early education proposition at all. Any advantage that may have value in terms of language measures which may derive from early training is no longer measurable at fourth through eighth grades. If anything, the results show that the Early Entrants are still at a disadvantage. The results also lend support to the opinions of the early proponents of delayed schooling, and are in harmony with the concepts outlined by John Dewey and E. White (1903, pp. 33, 40-1; 1872, pp. 131-48) at the turn of the century.

Previous research is indecisive or nondefinitive about the possible effect that kindergarten and preschool formal education experience has on children's learning. Therefore it would be necessary to speculate as to the value or detriment that kindergarten and preschool formal education may be to the child.

The relationships of written language function and visual maturity reported by Chalfant and Scheffelin (1966, pp. 23-6); Yakovlev (1962, pp. 3-46); Hilgartner (1963, pp. 3, 5); and Newton (1972, p. 1) were attributed to the effects of stresses that young children experience when subjected to skills-tasks before they are maturationally ready for them. The findings of the present study are consistent with those reported by these authors. The possibility of the role of stress should not be overlooked since motivation to learn skills for which a child is maturationally unready provides a source of stress. To the extent that stresses have their effect upon the young child, these results provide added evidence to suggest caution in introducing language skills activities too early.

There are several aspects of the study that are seen as having operated to attenuate the results of the investigation. One of these is the fact that both groups were composed only of subjects who had progressed at the rate of one grade per year. It would seem that repeaters in the E-E group, or students who advanced at a rate faster than one grade each year, possibly would have operated to increase the results of the investigation. On the other hand, maturational factors likewise would be operating which possibly would have cancelled out any effects of this limitation.

Another attenuating factor was the use of an M.A. limitation in the selection-matching process of the subjects. The influence of this restriction is not known, but certainly should be considered for further investigation.

No report of sex differences is included in the present investigation. The reader is reminded that the primary purpose of the investigation is whether or not language functioning is affected by the child's early entry to first grade. It is well recognized that girls develop earlier than boys in various verbal activities and skills (Baer, 1958, p. 15; Birch, 1954, p. 85; Betts, 1943, pp. 225-26; and Lenneberg, 1967, p. 139). The fact that the subjects were matched for sex in the selection-screening procedures did serve to control the sex difference factor, but it still needs to be investigated further.

The foregoing discussion raises a question of whether the results reflect more the child's stage of development rather than the duration of the school experience. It appears to be appropriate to suggest that desirability of making comparisons between the E-E and L-E subjects matched on the basis of CA. If the differences noted are attributable to developmental factors that are more than school experience, they would be expected on the basis of the basic hypothesis of this study. The present investigation was not designed to consider this factor. This aspect of the study should be considered for further investigation.

A question may be raised whether or not differences observed in the present study would be found in subjects of a higher age level. This would be suggested by the findings and conclusions of Baer (1958, pp. 17-19); Forrester (1955, pp. 80-81); Gott (1963, pp. 1-128); and Ilika (1963, pp. 118-24) who found that the Late Entrants were significantly higher in language achievement from the elementary grades through secondary school. This is also in agreement with Myklebust's (1965, pp. 36-93) comments regarding sequence of growth patterns curves in language development. The evidence in the present study does not give any way of knowing whether there is a decreasing difference between the groups in regard to time. This is an area that requires further research.

The present investigation indicated that the E-E children were rated consistently lower than the L-E group of subjects in the production of vowels and diphthongs, but not at a significant level. Wepman (1969, pp. 1-6) has provided us with a clue for this finding. He indicated that auditory function progresses through to maturity up to about age nine. Carter and McGinnis (1970, pp. 51-2) also suggest that articulatory function levels off at about nine years of age.

All the subjects of the investigation were at least eight years, nine months of age at the time samples for vowel articulation data were recorded. Thus the vowel and articulation tests provided measures of function in a dimension that was no longer developmentally timed for the subjects studied. Thus the negative results on the vowel articulation test provide added evidence in support of the basic hypothesis of this investigation.

A similar interpretation is made in regard to the results of consonant articulation. Again the subjects are above the age of developmental change therefore no differences between groups should be anticipated.

Inflection is an important language factor in the relatively complex functions of speech and language relating to maturational sequences (Cole, 1938, p. 282; Lenneberg, 1967, pp. 139-42; Myklebust, 1965, pp. 1-25, 30-35, 66; and Wepman, 1969, pp. 1-6). Results of this study indicated that there were significant differences in favor of the L-E group. The inflection ratings obtained for the present study were based on a reading presentation--the subject's recorded PSLT written paragraph speech sample. Two interpretations of the results seem possible: (1) the L-E subjects have learned how to read with better inflection; or (2) the L-E subjects use better inflection.

When the results of the oral reading test are taken into consideration, it seems that the first interpretation is plausible. It is noted that the L-E subjects scored better on the oral reading sub-test. Since they are superior in reading in general, it would be anticipated that reading inflection would also be superior.

There is good support for the interpretation that the L-E subject's use of better inflection represents a better language superiority and not just a reading skill. The rationale behind the development and use of the PSLT is offered in support of this position. Written language is a higher level skill than that of spontaneous speech according to Myklebust (1965, pp. 1-35, 66). He suggests that a written paragraph gives measurement into a higher age range because the writing skill taxes the system, whereas, the lower level skill of a spontaneous oral paragraph doesn't so much. This provides a means to differentiate subject's level of language function up to higher age ranges. In the same way, inflection of oral reading would appear to be a higher level skill than spontaneous speech. This is an area that has not been investigated fully. Since significant results were obtained in the present study, further study is indicated.

Most of the investigators cited used the CTMM as their index of language function. For that reason the CTMM measures of the present study would be expected to be comparable to prior results. Other measures used as reading comprehension, accuracy of oral reading, reading rate, productivity and syntax of written language, and inflection used in the present study show a high correlation to the CTMM measures. These results provide support for the prior interpretations that early entrance to school does not promote language development.

The Early Entrant's achievement on the CTMM sub-tests of "mechanics" and the PSLT "syntax-quotient" was low. This finding supports the concept that language is something that cannot be taught precisely before permitted in the orderly sequential pattern of maturation. The results also raise the question that steps to do so at too early an age prevent and distort the proper sequences of language development. This concept is suggested by Jesperson (1922, pp. 11-50); Van Riper (1954, pp. 10-37); and Wepman (1969, pp. 1-6). Another researcher, Heffernan (1968, pp. 494, 496-7), was even stronger in the conclusion that children are denied their childhood by forcing formal language upon them at too early an age.

The results seriously question if positive effects may be realized by the young child being in a formal preschool situation. A viable alternative to early entrance to school is his being at home with his family, and particularly with his mother. Whatever the shifting theories of child development, the importance of family and home has never been obliterated. An unanswered question about results favoring the home over the school for the young child is: "In what way is the home better for the child than the school?" In the review of the literature, several of the authors cited point to "the mothering" effect, developing attachments, maternal deprivation, socialization, and the security effect. Although these results do not give a firm basis for the home-based parent education concept, they clearly point to a need for further research. They indicate that if early schooling is not desirable then the viable option would be for the child to remain at home with his parent.

To the extent that these results favor the home over the school (Bowlby, 1952, pp. 11-12) for children 2 to 6½ years of age, they point to a need for home-based language promotion programs. Two examples of home-based language programs dealing with parent education for acquisition of skills in the daily routine chores of the home for techniques, procedures, objectives and goals of language acquisition by their own children are projects of Moore and Clausen (1975, p. 19) and Hyder (1975, pp. 1-17). In such home-based programs, the parents will plan for and provide experiences in the daily routines of the home which will encourage language use and promote development of receptive and expressive activities to develop language and speech skills. This aspect of the study calls for further investigation.

Basic Limitations of the Study

In the preceding paragraphs, the attention of the reader has been directed toward the principal results of the study and their interpretation. There are limitations that must be considered. The most important limitations are related to size of sample, subject selection, and instruments used.

Size of sample

In planning for this study, it was recognized that the potential number of students for the study was small because of the small number of children who enter first grade after their seventh birthday. It was felt, however, that the importance of the premises of the investigation warranted proceeding in spite of this limitation. Various controls used for subject selection further operated to reduce the sample size. Since the number of subjects is small, these results must be interpreted as pilot results. Since the findings do support the hypothesis of the study, further study with a larger sample size is indicated.

Subject selection

Some of the criteria employed in the subject screening-selection-matching stages resulted in the elimination or exclusion of a large number of possible subjects. These included aspects of school population, cultural factors, socio-economic status, and various other selection-screening controls such as grade pairing instead of age pairing, exclusion of "repeaters," and matching. It would have been desirable to have compared the subjects considering the above-mentioned factors. Because the potential sample size was too small to permit the use of sub-groups, these considerations were beyond the scope of the present investigations.

One of the results of imposing the criteria for selection that the Late Entrants could not have any preschool and kindergarten experiences may partially explain that the significant differences were found in favor of the L-E group. Likewise, the lower scores of the E-E group possibly are caused by the potential danger of preschool and kindergarten experiences at too early an age of entry. This danger may overshadow the potential effect of the danger of early entrance to first grade. However, it is noted that the present study did not permit the comparison of age peers. Consideration of these factors in future research is indicated.

Another question that may be raised is in regard to whether the population of the schools cooperating in the present study represents a sub-culture. Sub-cultures, class differences, and economic changes are important cultural factors to consider. A sub-culture may constitute or consist of a foreign population within the communities of some of the four schools in a large university community such as the Loma Linda community. A sub-culture may consist of a high proportion of better-than-average people at the other end of the continuum. Class differences exist within the sub-culture. The parents of the middle class individual have social contacts and relationships with other people largely of differing classes. It is possible that sub-cultures may exist, but on the basis of the available data, one cannot find any readily definite information about the population of the four schools which provide a clear picture of one or more of them really constituting a sub-culture, per se.

Another factor requiring careful consideration lay in the difficulty of assessing the variable of socio-economic status. Moreover, concerning the appraisal of the socio-economic status of each subject, it was deemed more desirable to employ an existing feasible technique, in spite of its obvious limitations, than to make no attempt to provide a control for socio-economic status. As stated in Chapter II, prior research indicates that the findings are different if such methods are employed from those of investigations in which no weight is given to the socio-economic status of the subjects.

For this reason and the possibility of a sub-culture in the population, it may be recognized that the groups of children may not be as well matched as would be desired in both groups strictly according to socio-economic status. The evidences available to the writer of the present study have led him to conclude that the two groups are fairly representative. The subjects by and large are drawn from the same socio-economic status.

Instruments used

The CTMM was selected for use in the present investigation because it provided sub-test results that could be employed for the investigation.

There have been a number of criticisms of this instrument because of the attempts to describe factor variables. The validity of these criticisms would be interpreted in light of one's viewpoint of global versus factoral intelligence. Of more importance, however, is the overall validity and reliability of the instrument. Burt (1959, pp. 433-4), Freeman (1959, pp. 436-7), and Milholland (1959, p.39) all have indicated that the test taken as a whole provides an excellent instrument for assessing general capacity (Burt, 1959, p. 434). The results compare well with other intelligence scales.

In the light of research results cited above, it was felt that the CTMM met the needs of the present investigation.

In reference to the above criticisms of the CTMM, it is somewhat of a situation of who is calling the "strikes." Some authors defend it in these areas, while others find it lacking.

Recommendations

The conclusions that have developed from these findings are that, as a group, children entering first grade at an older age achieve better in language functioning than their younger counterparts. This conclusion has implications for educational planning which seem appropriate.

Implications for education

First, educational personnel need to be informed and alerted concerning the apparent language status of the E-E (Early Entrants) children. This is particularly important as the drive for earlier and earlier entry age to first grade for cognitive growth for "all" children continues to gain momentum despite substantial evidence to the contrary.

Second, the recommendation to avoid early school entrances does not deny the need for intensive intervention for remediation for the handicapped or seriously deprived children. Continued attention should be given to provision for special emphasis in the varied programs for speech development and language training to children who demonstrate a speech and/or language handicap. For such children, continued emphasis should be placed beginning on this type of training at the pre-school level.

To the extent that these results indicate the desirability of late entrance to school, there is an implied need for programs which will facilitate language development, at least for the deprived child. One solution would be to provide a home-based program. Further research of this proposal is indicated.

There remains much controversy about readiness for the cognitive aspects of speech and language. The results of this study warn of dangers to the young child who is enrolled in first grade before his vision, hearing, sensory and intersensory perception in general have matured.

Third, provision should be made by both public and private schools to accommodate parents who wish to act in accordance with research which would indicate that the child should be taught by his parents as the only teachers of their children until they have reached eight or ten years of age. Notwithstanding limitations of maturity, the schools should provide non-graded arrangements that permit each child to move along at his own speed, freed of the lockstep grades one through twelve. In adapting instructional goals to meet individual needs, age, and sex, as well as scholastic ability problems would not assume such insurmountable obstacles presently presented by general early admission to first grade in these private schools.

Special attention should be provided in experiences to promote comprehension rate of oral reading, inflection of speech, written expression and mechanics of language, silent reading, vocabulary, and perhaps in spelling, oral reading accuracy and comprehension, consonant articulation, written language areas of productivity, and abstract-concrete, for all children after the stage of developmental readiness. Other speech-language skills to be included would be articulatory development and correction wherever necessary, and training in inflection of English speech.

Suggestions for additional research

In spite of the increase of research in ECE programming in recent times, there are many unanswered queries concerning the problems of language functioning of Early Entrants to first grade. Some suggestion for further research have been indicated. The primary areas are: (1) sex differences in the two groups of Early and Late Entrants regarding language achievement; (2) role of age comparison versus the number of school years completed; (3) need for a longitudinal study of language functioning of the two groups through higher age levels to adulthood; (4) effects of sample size; (5) need for home-based program to study home language pattern of children in their environment; (6) the role of age at which time children are removed from the home for preschool and kindergarten cognitive education and the effect on children's later language functioning; (7) non-cognitive experience pre-first program's relationship to subsequent language patterns of children in their childhood language development; (8) comparison of the difficulty between the complicated skill of oral language inflection in oral reading and oral spontaneous speech; (9) cultural factors related to possible existence of sub-cultures in the populations of the schools; and (10) assessment of the variable of socio-economic status of subject by reference to occupation of both parents versus a single parent. The results of the present investigation also suggest the need for further research and development in the following secondary areas.

1. Other geographic areas. Inasmuch as this research was conducted in California where the minimum entry age to first grade is five years, nine months for children, further valuable investigation is indicated for a comparable study in some other geographic area where the entrance age to first grade is more than six years in the public and private schools of the state. What, if any, would the factor of age differences affect the results of the investigation?

2. Early stress and delinquency. There is reason to believe that anxiety, frustration, and loss of motivation incurred in part by forcing "formal language" and reading upon children at too early an age by early schooling or seriously deprived homes may be the seeds of school failure and delinquency. Ethical deprivation or retardation may be a more serious concern than mental retardation and similar cognitive anomalies.

3. Maternal deprivation. Specific effects of maternal deprivation upon language functioning urgently need further investigation, and emphatic highlighting to make certain that parents and educational personnel perceive more clearly the extent that younger children are affected generally when they leave the warmth and environmental uninterrupted continuity of a wholesome home, and/or when their homes do not provide this warmth and continuity.

4. Physiological and psychological development. Inasmuch as research evidence indicates that the brain does not reach physical maturation until the child is eight or ten, and further investigation on cognition point out that a readiness for sustained high cortical thinking--such abstract thought as needed in reading, language functtions, etc.--is reached only after age seven or eight, additional research studies are needed in language development which correlate neurophysiology and cognition in certain groups of children between ages three and four to nine or ten years.

5. Other language environments. If it were feasible in terms of matched subjects, the linguistic functions of E-E and L-E (Early vs. Late Entrants) children who communicate in languages other than English in another country might fruitfully be compared in a comparable study to

the present investigation.

A similar comparison should be made among subjects in both English-speaking and other language environments with similar designs among subjects in the higher IQ brackets. Research along such lines should be undertaken with carefully matched groups of subjects, even though only small groups were available from the population samples. Such research studies might provide support for guidelines, or at least a basis for determination of what chronological age, or mental age, a child should ordinarily begin "formal language" development skills in first grade.

6. Pre-first language activities. Further investigation is indicated to determine whether the present program (at some of the schools cooperating in the present study) of special admission to a pre-first class for the Early Entrants before they reach the appropriate age for first grade has desirable effects. Longitudinal studies of their achievement and social adjustment in comparison to that of Late Entrants to first grade are indicated. Administrators need to assess carefully these effects in terms of several areas of research enumerated above in this section.

This research suggests the basis for the consideration of several important controversial issues as complementary aspects of early childhood education, both in the area of educational administration and the curricular practice of non-graded arrangements as adjustments to meet individual differences in the classroom.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the present investigation was to inquire whether or not language functioning is affected by children's early entry to first grade as compared to late entry to first grade.

Comparisons were obtained to test the hypothesis that formal experiences in language skills is ineffective in promoting language maturity unless provided in harmony with the biologic-developmental sequence for the child.

Two groups of children, fifteen in each group, were selected as subjects for the study. The groups were identified as: (1) E-E, Early Entrants, composed of children who were six years, three months or less at the time they entered first grade; and (2) L-E, Late Entrants, composed of children who were six years, eleven months or older when they entered first grade. The general description of the two groups is summarized on Table 83.

Analysis of variance procedures were employed to compare the two groups on 19 variables studied. The variables studied were: (1) mechanics of English language; (2) expression of English language; (3) spelling; (4) total general language development; (5) silent reading vocabulary; (6) silent reading comprehension; (7) total silent reading skills; (8) combined general language arts achievement; (9) oral reading accuracy; (10) oral reading comprehension; (11) oral reading rate; (12) total oral reading skills; (13) consonant articulation in English; (14) inflection; (15) general language arts achievement ratings; (16) vowel production; (17) written language productivity; (18) written language syntax quotient; and (19) written abstract-concrete language.

Thirty-two null hypotheses statements were posited. The first twelve of these comprise a group of hypotheses regarding achievement test data in mechanics of English language, expression of English language, spelling, and reading. Thirteen null hypotheses were concerned with consonant and vowel articulation. Two null hypotheses considered inflection and general language arts ratings. The last five null hypotheses considered the written language areas of verbal behavior such as: productivity, syntax, and abstract-concrete.

Summary of the Findings

The results of analyses relating to the variables of the present investigation are as follows:

Mechanics and expression of English language, spelling, and reading

1. The mean for mechanics of language for the L-E group was significantly greater than for the E-E group (hypothesis number one rejected).

2. The mean for the expression of English language for the L-E group was significantly greater than for the E-E group (hypothesis number two rejected).

3. There was no significant difference between the mean of spelling for the two groups (hypothesis number three).

4. The mean for the total general language development for the

L-E group was significantly greater than for the E-E group (hypothesis number four rejected).

5. The mean for the silent reading vocabulary for the L-E group was significantly greater than for the E-E group (hypothesis number five rejected).

6. The mean for silent reading comprehension for the L-E group was significantly greater than for the E-E group (hypothesis number six rejected).

7. The mean for total silent reading skills for the L-E group was significantly greater than for the E-E group (hypothesis number seven rejected).

8. The mean for total general language arts achievement (combined total results of mechanics, expression, spelling, and reading) for the L-E group was significantly greater than for the E-E group (hypothesis number eight rejected).

9. There was no significant difference between the mean of oral reading accuracy for the two groups (hypothesis number nine).

10. The mean for oral reading comprehension (performance rating) for the L-E group was significantly greater than for the E-E group (hypothesis number ten rejected).

11. The mean for oral reading rate (stanines and performance ratings) for the L-E group was significantly greater than for the E-E group (hypothesis number eleven rejected).

12. The mean for total oral reading skills (oral reading accuracy, oral reading comprehension, and rate for performance rating) for the L-E group was significantly greater than for the E-E group (hypothesis number twelve rejected).

Ten of these twelve null hypotheses regarding mechanics and expression of English language and reading were rejected at the .05 level of significance.

Phonology: consonant and vowel articulation

1. There was no significant difference between the means of articulation measures of substitutions, distortions, and total articulatory errors for the two groups although the E-E group made more errors than the L-E group (hypothesis number 13).

2. There was no significant difference between the means of vowel production of the two groups for ten vowels and two diphthongs (hypotheses numbers 16-27). These results do not reject the thirteen null hypotheses regarding vowel and consonant articulation.

Ratings of speech and language performance: inflection and general language arts achievement

1. The mean for inflection of American English speech for the L-E group was significantly greater than for the E-E group (hypothesis number 14 rejected).

2. The mean for general language arts achievement for the L-E group was significantly greater than for the E-E group (hypothesis number 15 rejected).

These results reject the two null hypotheses regarding inflection and general language arts achievement.

Written language verbal behavior: productivity, syntax, and abstract-concrete

1. There was no significant difference between the mean of written language area of total words for the two groups (hypothesis

number 28).

2. There was no significant difference between the mean of written language area of total sentences for the two groups (hypothesis number 29).

3. There was no significant difference between the mean of written language area of words per sentence for the two groups (hypothesis number 30).

4. The mean for written language area of syntax for the L-E group was significantly greater than for the E-E group (hypothesis number 31 rejected).

5. There was no significant difference between the mean of written language area of abstract-concrete for the two groups (hypothesis number 32).

One of these five null hypotheses regarding syntax in written language verbal behavior was rejected at the .05 level of significance.

There was a distinctive difference between items which would be attributed as performance type items and those which would be recognized as language competence items. It was proposed that this difference would reflect the developmentally-based aspect of language competence acquisition.

Conclusions

For the conditions under which the subjects in the present investigation are studied, the following general conclusions seem warranted:

1. The results are interpreted as giving support to the premise that the early introduction of formal language skills-acitivites out of the maturational developmental sequence do not promote maturation.

2. The results support the premise that any gains of the Early Entrants group are not of long term value.

3. The results indicate that a distinction can be made between competence items and performance items. There is evidence that linguistic competence appears to be more closely keyed to the developmental maturation in children of the elementary grammar school age than does linguistic performance.

4. The results seemed to indicate support for previous investigations which contra-indicate the value of early education.

Conclusions related to the specific hypotheses of the study are as follows:

Mechanics and expression of English language, spelling, and reading

1. The children who entered first grade after six years, eleven months (L-E group) are superior in mechanics of English language to children who entered first grade before six years, three months (E-E group).

2. The children who entered first grade after six years, eleven months (L-E group) are superior in expression of English language to children who entered first grade before six years, three months (E-E group).

3. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in spelling.

4. The children who entered first grade after six years, eleven months (L-E group) are superior in total general language development to

children who entered first grade before six years, three months (E-E group).

5. The children who entered first grade after six years, eleven months (L-E group) are superior in silent reading vocabulary to children who entered first grade before six years, three months (E-E group).

6. The children who entered first grade after six years, eleven months (L-E group) are superior in silent reading comprehension to children who entered first grade before six years, three months (E-E group).

7. The children who entered first grade after six years, eleven months (L-E group) are superior in total silent reading skills to children who entered first grade before six years, three months (E-E group).

8. The children who entered first grade after six years, eleven months (L-E group) are superior in combined general language arts achievement to children who entered first grade before six years, three months (E-E group).

9. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in oral reading accuracy.

10. The children who entered first grade after six years, eleven months (L-E group) are superior in oral reading comprehension to children who entered first grade before six years, three months (E-E group).

11. The children who entered first grade after six years, eleven months (L-E group) are superior in oral reading rate to children who entered first grade before six years, three months (E-E group).

12. The children who entered first grade after six years, eleven months (L-E group) are superior in total oral reading skills to children

who entered first grade before six years, three months (E-E group).

Phonology: consonant and vowel articulation

13. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in consonant articulation.

14. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in vowel and diphthong articulation (hypotheses numbers 16-27).

Ratings of speech and language performance: inflection and general language arts achievement

15. The children who entered first grade after six years, eleven months (L-E group) are superior in inflection of American English speech to children who entered first grade before six years, three months (E-E group) (hypothesis number 14).

16. The children who entered first grade after six years, eleven months (L-E group) are superior in general language arts achievement ratings to children who entered first grade before six years, three months (E-E group) (hypothesis 15).

Written language verbal behavior: productivity, syntax, and abstract-concrete

17. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in written language productivity areas of total words, total sentences,

and words per sentence (hypotheses numbers 28-30).

18. The children who entered first grade after six years, eleven months (L-E group) are superior in written language area of syntax to children who entered first grade before six years, three months (E-E group) (hypothesis number 30).

19. There is no significant difference between the children who entered first grade after six years, eleven months (L-E group) and children who entered first grade before six years, three months (E-E group) in written language abstract-concrete area (hypothesis number 32).

Overall appraisal of language functioning

20. The children who entered first grade after six years, eleven months (L-E group) are superior in an overall appraisal of language functioning with all linguistic variables weighted equally to children who entered first grade before six years, three months (E-E group) (Table 61).

Recommendations

Implications for education

These results are interpreted as giving conclusive support for the basic premise that an early introduction of formal language skills activities out of the maturational developmental sequence does not promote maturation. Implications of these results suggest the following recommendations:

First, that educational personnel need to be aware of the fact that the children at an early age have not shown the same growth in language development as other children that had an equal school experience.

Second, the need for home-based language promotion program for such speech/language impaired children of pre-school and kindergarten age should be considered.

Third, private and public schools should set about to accommodate parents who wish to be the child's teacher until the child has become eight years of age, and then adapt a non-graded approach to education to permit the child to move along according to his own speed and ability.

Suggestions for additional research

Added research is needed to answer questions regarding the following primary areas:

1. Is there evidence of a sex factor which contributes to the differences in language functions noted?

2. Would the results of this study hold if children had been matched on the basis of an age comparison rather than on the basis of equal years in school since admission to first grade?

3. Would the differences noted prevail if the study included subjects whose upper age level was further extended to secondary school graduation?

4. Would these results be obtained if a larger sample of subjects were employed?

5. Are there differences in the language patterns used in the home-language environment that might have contributed to the results of the study?

6. Would there be a relationship between results as obtained in this study and the age at which children are removed from the home?

7. Is there a relationship between the content of pre-first

non-cognitive experience programs and later language patterns of children?

8. Is there a relationship between inflection during reading and inflection during spontaneous speaking?

9. Would the differences noted prevail if cultural factors such as a sub-culture had substantially represented the school population?

10. Would the differences be obtained if the subject's socio-economic status had been determined by occupational title of the mother in lieu of the father?

Additional secondary areas of research also were indicated:

1. Would the factor of age differences in another geographic area with a minimum school entry age to first grade of more than six years have contributed to differences noted?

2. Would there be a relationship between anxiety, frustration, and loss of motivation incurred partly by forcing in early schooling "formal language" upon children too early, and the condition of deprived homes in resultant school failure and delinquency?

3. Is there a relationship between the effects of maternal deprivation for young children when they leave the warmth and uninterrupted continuity of a wholesome home for early school and their later language functioning?

4. Is there evidence from a correlation of physiological and psychological development study in the fields of neurophysiology and cognition for the child's physical maturation of the brain in readiness for high cortical thinking which contra-indicates early learning of formal language skills before the child is eight?

5. Would the differences noted prevail if the study included

subjects in another country in a language environment other than English?

6. Is there a relationship between children's pre-first non-cognitive educational experiences, and their readiness for, and later language development skills?

APPENDICES

APPENDIX 1. RATING SCALES, PICTURES, AND FORMS USED.

Dear Parents,

Mr. Guy Hyder, with the approval of the Southeastern California Conference Dept. of Education and in cooperation with the school of education of Loma Linda University, is working on a research project trying to determine the effects of a maximum amount of adult contact and late entrance to formal education vs. minimal amount of adult contact with a maximum amount of group interaction before entering formal schooling. The questionnaire is necessary to give us the insight for picking case studies. No case studies will be made without parent's permission and parent conferences.

We would appreciate your filling out the questionnaire and returning it promptly.

Sincerely,

Principal

FAMILY QUESTIONNAIRE

STUDENT NAME______________________ AGE________ GRADE__________
HOME ROOM______________

Year____	Month____	1.	State age of your child when he entered first grade.
Year____	Month____	2.	State present age of your child.
Yes____	No____	3.	Prior to entrance to kindergarten did your child attend a pre-school program (nursery school from age 3 to 5 years)?
Yes____	No____	4.	Prior to entrance to first grade did your child attend kindergarten?
Private__	Public____	5.	Was the pre-school or kindergarten private or public? Give name of pre-school______________________ Number in class______________ Give name of kindergarten______________________ Number in class______________
SDA____	Non-SDA____	6.	State whether kindergarten or pre-school program was SDA or not. Give name of pre-school______________________ Number in class______________ Give name of kindergarten______________________ Number in class______________
Parent____ Relative__	Public Sitter____ Friend____	7.	If answer to #3 and/or #4 above is "no", please indicate if child was with parent, close relative, friend, or public sitter most of the time prior to entry to first grade. Explain:

____________ Elementary

Dear Parent:

Your child has been selected to participate in the study sponsored by the Southeastern California Conference Department of Education. The purpose of the study is to compare students who entered first grade at various age levels; in the area of language arts.

A student from the graduate school of Loma Linda University will direct the speech and language-tests, at your child's school. This will not interefere or affect your child's regular program, no pupil will be identified by name in the information submitted for research.

We are pleased to have your child at our school, and would appreciate your assistance in this study. We would appreciate your returning the consent on behalf of your child on the lower portion of this letter.

Principal at ____________________
and Research Team

February 1974

Re: __________________ Grade _____ Room _____

On behalf of my child(above mentioned), I hereby consent freely for the participation of my child in the above mentioned research at his school.

(Parent's Signature) __________________________

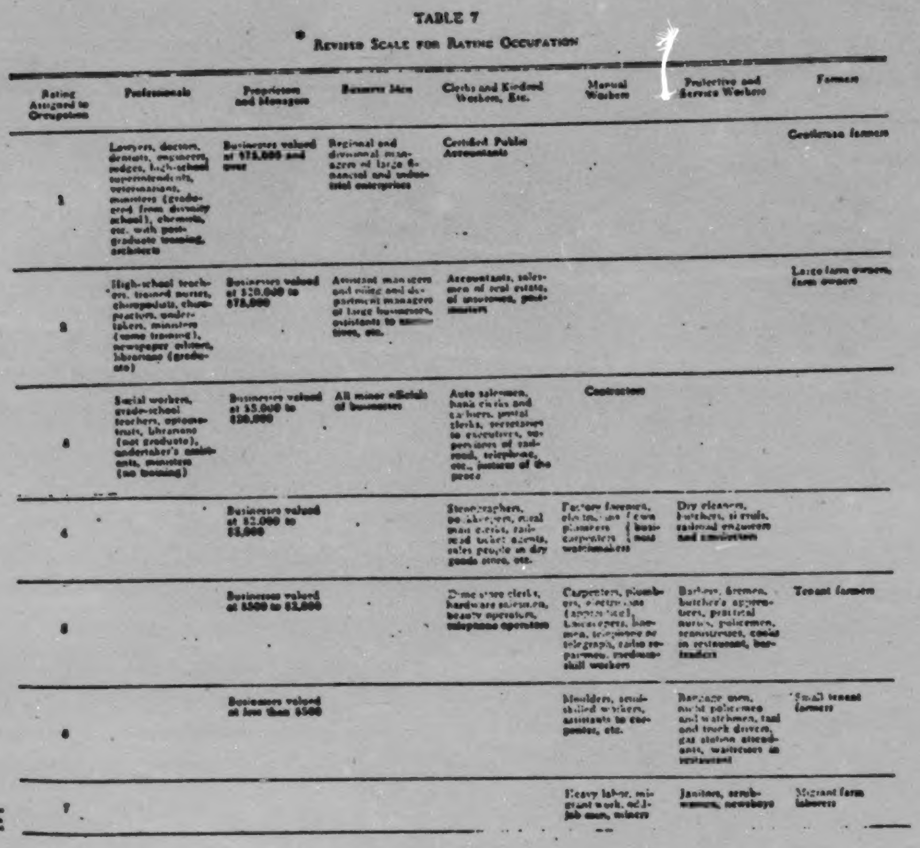

TABLE 7

* REVISED SCALE FOR RATING OCCUPATION

Rating Assigned to Occupation	Professionals	Proprietors and Managers	Business Men	Clerks and Kindred Workers, Etc.	Manual Workers	Protective and Service Workers	Farmers
1	Lawyers, doctors, dentists, engineers, judges, high-school superintendents, veterinarians, ministers (graduated from divinity school), chemists, etc. with post-graduate training, architects	Businesses valued at $75,000 and over	Regional and divisional managers of large financial and industrial enterprises	Certified Public Accountants			Gentleman farmers
2	High-school teachers, trained nurses, chiropodists, chiropractors, undertakers, ministers (some training), newspaper editors, librarians (graduate)	Businesses valued at $20,000 to $75,000	Assistant managers and office and department managers of large businesses, assistants to executives, etc.	Accountants, salesmen of real estate, of insurance, postmasters			Large farm owners, farm owners
3	Social workers, grade-school teachers, optometrists, librarians (not graduate), undertaker's assistants, ministers (no training)	Businesses valued at $5,000 to $20,000	All minor officials of businesses	Auto salesmen, bank clerks and cashiers, postal clerks, secretaries to executives, supervisors of railroad, telephone, etc., justices of the peace	Contractors		
4		Businesses valued at $2,000 to $5,000		Stenographers, bookkeepers, rural mail clerks, railroad ticket agents, sales people in dry goods store, etc.	Factory foremen, electricians, plumbers, carpenters, watchmakers (own business)	Dry cleaners, butchers, sheriffs, railroad engineers and conductors	
5		Businesses valued at $500 to $2,000		Dime store clerks, hardware salesmen, beauty operators, telephone operators	Carpenters, plumbers, electricians (apprenticed), timekeepers, linemen, telephone or telegraph, radio repairmen, medium-skill workers	Barbers, firemen, butcher's apprentices, practical nurses, policemen, seamstresses, cooks in restaurant, bartenders	Tenant farmers
6		Businesses valued at less than $500			Moulders, semi-skilled workers, assistants to carpenters, etc.	Baggage men, night policemen and watchmen, taxi and truck drivers, gas station attendants, waitresses in restaurant	Small tenant farmers
7					Heavy labor, migrant work, odd-job men, miners	Janitors, scrubwomen, newsboys	Migrant farm laborers

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* William Lloyd Warner, Marchia Meeker, and Kenneth Eells, Social Class in America (New York: Harper and Brothers Publishers, 1960), pp. 140-141.

SAMPLE
LANGUAGE SCORES SURVEY SHEET FOR POSSIBLE SUBJECTS

NAME					READING						LANGUAGE								Birthdate			Occupation		TOTAL BATTERY	
	CA	[illegible]	[illegible]	TOTAL	VOCABULARY		COMPREHENSION		TOTAL		MECHANICS		EXPRESSION		SPELLING		TOTAL								
		IQ	IQ	IQ	1	2	1	2	1	2	1	2	1	2	1	2	1	2	mo.	da.	yr.	Father	Mother	1	2
	TOTAL MA	%ILE	%ILE	%ILE	3	4	3	4	3	4	3	4	3	4	3	4	3	4						3	4
** 73					51	53	39	28	45	35	54	56	37	38	43	34	45	35						[illegible]	45
A4 '72	59-61	101	100	101	24	31	35	14	29	31	[illegible]	27	33	29	41	45	32	35						52	54

** Example of data collected.

-- Please encircle your number -   Date: __/__/__

-- Rater No. #1, #2, #3, #4, #5, #6, #7, #8, #9, #10 #11 #12

RATING SCALE FOR INFLECTION OF ENGLISH SPEECH

	RANGE OF FIVE POINTS				
	LEVEL OF QUALITY				
	1	2	3	4	5
PUPIL'S NAME:	GOOD (VERY) OUTSTANDING EXCELLENT	ABOVE AVERAGE (GOOD)	GOOD (FAIR) AVERAGE ONLY	BELOW AVERAGE POOR	VERY POOR PATTERN
(Last Name) (First Name) (Middle)					
Early Group					
Late Group					

Grade: Encircle: 4 5 6 7 8

TEACHER'S NAME: ____________________

SCHOOL: No. (1) (2) (3) (4)
(Encircle: ____________________

____

Date: __/__/__

** Please encircle your number –
** Rater No. #1, #2, #3, #4, #5, #6, #7, #8, 9, 10, 11, 12

RATING SCALE FOR INFLECTION OF ENGLISH GENERAL

LANGUAGE DEVELOPMENT

PUPIL'S NAME:	RANGE OF FIVE POINTS				
	LEVEL OF QUALITY				
	1	2	3	4	5
	GOOD (VERY) OUTSTANDING EXCELLENT	ABOVE AVERAGE (GOOD)	GENERAL AVERAGE ONLY	BELOW AVERAGE POOR	VERY POOR PATTERN
__________ (Last Name) __________ (First Name) __________ (Middle)					
Early Group					
Late Group					

Grade: Encircle: 4 5 6 7 8
TEACHER'S NAME: __________
SCHOOL: No. (1) (2) (3) (4)
Encircle: __________

1- Please encircle your number. Date: ___ - ___ - 1974
- Rater No. 1 2 3 4 5 6 7 8 9

JUDGMENTS OF ACCEPTABILITY OF VOWELS AND DIPHTHONGS

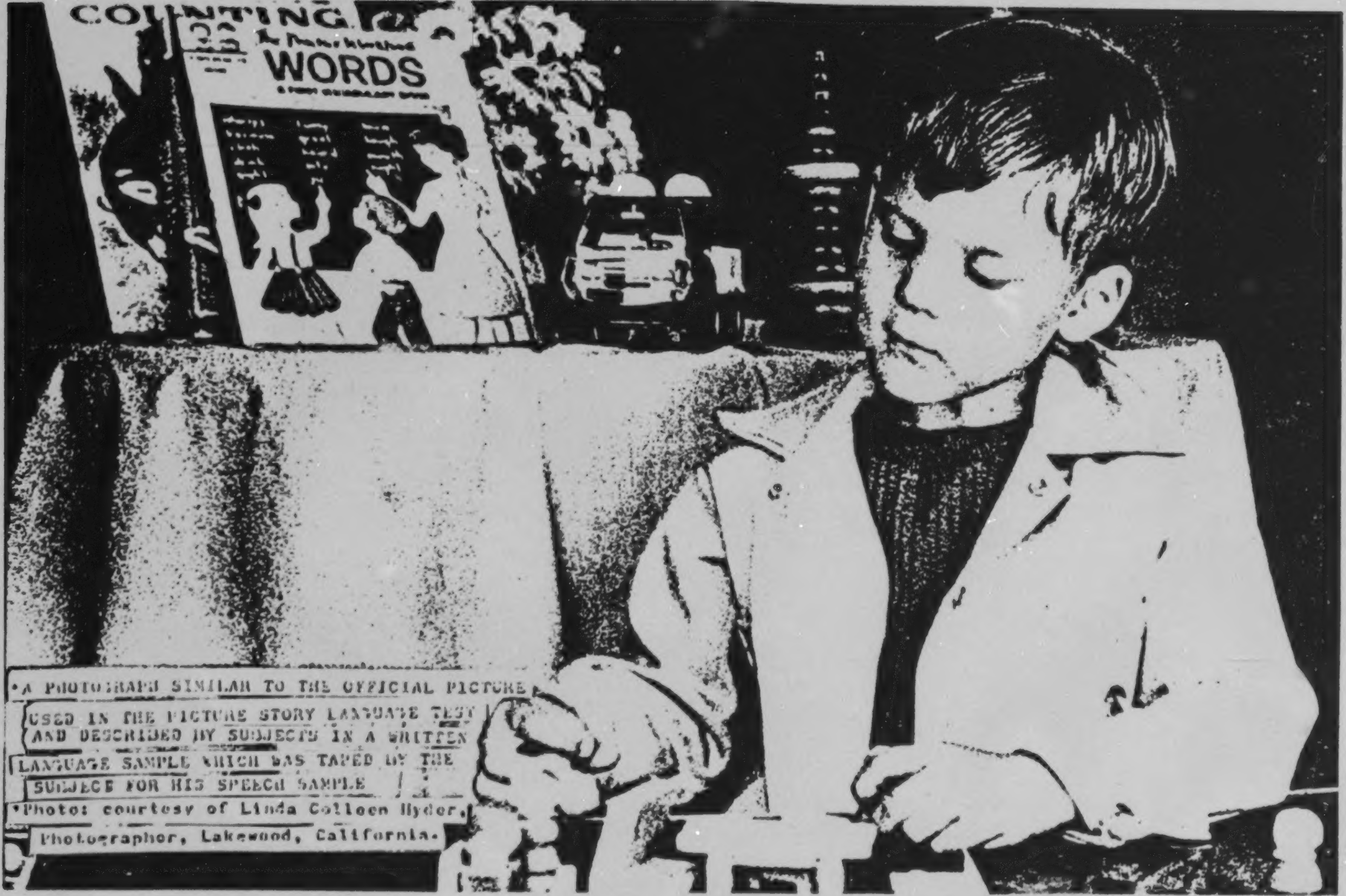
RANGE OF TWO POINTS
LEVEL OF QUALITY

ORDER	ID NO	JOE (O)	TOOK (U)	FATHER'S (a)	SHOE (u)	BENCH (ε)	OUT (au)	[illegible]	LAID (ei)	IT (I)	THE (ə)	[illegible]	[illegible]
01	011												
02	052												
03	021												
04	031												
05	062												
06	041												
07	072												
08	082												
09	101												
10	301												
11	092												
12	312												
13	112												
14	262												
15	271												
16	121												
17	131												
18	172												
19	141												
20	182												
21	192												
22	151												
23	202												
24	161												
25	212												
26	221												
27	231												
28	242												
29	281												
30	252												
31													
32													

TOTALS
Early (EE)
Late (LE)

Rater's Names: ____________ ____________

Date: ___ - ___ - 1974



•A PHOTOGRAPH SIMILAR TO THE OFFICIAL PICTURE USED IN THE PICTURE STORY LANGUAGE TEST AND DESCRIBED BY SUBJECTS IN A WRITTEN LANGUAGE SAMPLE WHICH WAS TAPED BY THE SUBJECT FOR HIS SPEECH SAMPLE

•Photo: courtesy of Linda Colleen Hyder, Photographer, Lakewood, California.

APPENDIX 2. RAW DATA OF SOME LINGUISTIC VARIABLES.

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	B	C	D	E	F	G1	G2	G3	G4	H1	H2	H3	H4	I1	I2	I3	I4	I5
011	E41	1	63	111	3	43.	7.0	6.3	3.	16.	3.0	2.3	1.	271.	214.	1.20	72.	2.
021	E42	2	69	105	3	28.	4.0	3.9	2.	27.	6.0	5.4	2.	192.	216.	0.80	48.	2.
031	E43	2	71	107	3	35.	5.0	0.5	2.	27.	6.0	5.8	2.	168.	125.	1.30	78.	2.
041	E44	1	71	107	3	64.	9.8	9.8	4.	46.	9.8	9.8	4.	676.	625.	1.00	60.	2.
051	E45	2	71	107	1	26.	3.0	3.6	1.	30.	7.0	7.1	3.	95.	61.	1.50	90.	2.
061	E46	2	74	110	3	28.	4.0	3.9	2.	30.	8.0	7.5	3.	168.	191.	0.70	42.	2.
071	E51	1	67	127	3	23.	2.0	3.4	1.	22.	4.0	4.1	2.	119.	51.	2.30	138.	3.
081	E71	1	71	143	1	30.	2.0	4.4	1.	27.	4.0	5.8	1.	123.	105.	1.10	150.	3.
091	E72	1	71	143	1	67.	7.0	9.8	3.	44.	9.0	9.8	4.	689.	362.	1.90	114.	2.
101	E73	2	71	143	1	68.	7.0	9.8	3.	45.	9.0	9.8	4.	689.	284.	2.40	144.	2.
111	E74	2	71	143	4	72.	8.0	9.8	3.	43.	8.0	9.8	3.	942.	478.	2.30	138.	3.
121	E75	1	72	144	3	59.	7.0	9.4	3.	46.	9.0	9.8	4.	508.	418.	1.20	72.	4.
131	E81	2	72	156	4	44.	4.0	6.4	2.	37.	6.0	9.5	2.	176.	134.	1.30	78.	1.
141	E82	2	75	159	4	62.	6.0	9.5	2.	23.	2.0	4.2	1.	420.	288.	1.45	87.	2.
151	E83	2	75	159	3	54.	5.0	8.4	2.	34.	5.0	8.7	2.	220.	208.	1.00	60.	1.
162	L41	1	89	125	4	49.	6.0	7.4	3.	44.	9.0	9.8	4.	470.	245.	1.90	114.	3.
172	L42	2	83	119	2	43.	6.0	5.8	3.	31.	7.0	7.5	3.	271.	104.	2.60	156.	4.
182	L43	1	84	120	2	40.	6.0	5.8	3.	26.	6.0	5.4	3.	271.	94.	2.80	168.	4.
192	L44	1	84	120	2	25.	4.0	3.5	3.	21.	4.0	3.8	3.	192.	99.	1.90	114.	3.
202	L45	2	86	122	4	42.	7.0	6.1	3.	30.	7.0	7.1	3.	271.	110.	2.40	144.	4.
212	L46	2	89	125	2	65.	9.0	9.8	4.	64.	9.0	9.8	4.	631.	252.	2.50	150.	4.
222	L51	1	91	139	1	28.	3.0	3.9	1.	20.	4.0	3.4	2.	50.	25.	2.00	120.	3.
232	L71	1	84	156	1	47.	5.0	7.0	2.	39.	7.0	9.8	3.	420.	227.	1.80	108.	2.
242	L72	1	83	155	2	61.	6.0	9.7	2.	48.	9.0	9.8	4.	762.	336.	2.20	132.	3.
252	L73	2	89	161	2	71.	8.0	9.8	3.	44.	9.0	9.8	4.	942.	369.	2.50	150.	3.
262	L74	2	85	157	4	47.	5.0	7.0	2.	36.	6.0	5.1	2.	420.	160.	2.60	156.	4.
272	L75	1	92	164	1	57.	6.0	9.0	2.	51.	9.0	7.8	4.	762.	366.	2.00	120.	2.
282	L81	2	83	167	2	72.	7.0	9.8	3.	46.	9.0	9.8	4.	942.	429.	2.10	126.	2.
292	L82	2	88	172	4	55.	5.0	8.6	2.	38.	6.0	9.7	2.	581.	256.	2.20	132.	2.
302	L83	2	83	167	2	89.	9.0	9.8	4.	49.	9.0	9.8	4.	834.	373.	2.20	132.	2.

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	J1	J2	J3	J4	K1	K2	K3	K4	L1	L2	L3	L4	M1	M2	M3	M4	N1	N2	N3	N4
011	59.	8.	30.	4.	6.	8.	35.	3.	10.	9.	46.	4.	97.5	12.	45.	6.	17.	14.	70.	6.
021	68.	8.	40.	5.	9.	8.	45.	5.	8.	7.	10.	2.	95.0	9.	30.	4.	16.	11.	60.	6.
031	84.	9.	60.	5.	10.	9.	45.	6.	8.	8.	35.	4.	96.0	9.	35.	4.	22.	17.	98.	9.
041	43.	8.	15.	3.	4.	7.	15.	3.	11.	10.	65.	6.	92.0	9.	25.	4.	10.	8.	40.	4.
051	71.	8.	15.	3.	6.	7.	25.	4.	12.	11.	20.	3.	97.0	10.	30.	4.	8.	7.	10.	3.
061	36.	7.	5.	2.	2.	7.	2.	1.	18.	17.	98.	9.	94.0	8.	25.	4.	20.	17.	90.	9.
071	28.	7.	2.	1.	3.	7.	5.	2.	9.	9.	25.	4.	94.0	9.	20.	4.	10.	8.	25.	4.
081	75.	9.	10.	3.	8.	9.	40.	4.	9.	9.	10.	2.	96.0	10.	25.	3.	7.	7.	5.	2.
091	44.	8.	2.	1.	4.	7.	10.	3.	11.	10.	30.	4.	90.0	8.	2.	1.	10.	8.	15.	3.
101	61.	8.	10.	2.	5.	7.	18.	3.	12.	11.	35.	5.	96.0	9.	20.	4.	21.	17.	90.	8.
111	66.	8.	10.	3.	5.	7.	15.	3.	13.	12.	35.	5.	99.0	15.	50.	5.	23.	17.	98.	9.
121	138.	16.	50.	5.	10.	11.	55.	5.	14.	13.	45.	5.	98.0	17.	45.	5.	21.	17.	90.	8.
131	60.	8.	5.	2.	5.	7.	10.	3.	12.	12.	20.	4.	100.0	17.	85.	8.	21.	17.	90.	8.
141	76.	8.	95.	8.	9.	8.	45.	5.	8.	8.	2.	1.	93.0	8.	40.	5.	11.	8.	90.	8.
151	56.	8.	5.	2.	4.	7.	10.	3.	14.	13.	54.	5.	98.0	11.	40.	4.	23.	17.	90.	9.
162	70.	9.	25.	4.	7.	9.	45.	5.	10.	10.	53.	5.	97.0	16.	40.	5.	15.	11.	50.	5.
172	84.	9.	30.	4.	10.	9.	55.	6.	8.	8.	30.	4.	99.0	17.	90.	7.	21.	17.	90.	8.
182	59.	8.	10.	2.	8.	8.	40.	5.	7.	8.	15.	3.	95.0	9.	20.	3.	15.	10.	35.	5.
192	45.	8.	10.	3.	4.	70.	15.	3.	11.	11.	70.	6.	96.0	11.	30.	4.	10.	8.	30.	4.
202	61.	8.	10.	2.	4.	7.	15.	3.	15.	15.	85.	7.	91.0	8.	5.	2.	18.	14.	70.	6.
212	104.	10.	45.	5.	10.	9.	55.	5.	10.	10.	30.	4.	100.0	17.	100.	9.	17.	13.	50.	5.
222	63.	8.	20.	3.	7.	9.	40.	5.	9.	9.	30.	4.	100.0	17.	98.	9.	10.	8.	30.	4.
232	69.	8.	10.	3.	5.	8.	18.	3.	14.	13.	50.	5.	98.0	14.	55.	4.	7.	7.	5.	2.
242	68.	8.	10.	2.	5.	8.	15.	3.	13.	12.	45.	5.	97.0	16.	40.	4.	21.	17.	90.	8.
252	47.	7.	5.	2.	5.	7.	20.	3.	9.	9.	20.	5.	97.0	10.	35.	4.	18.	17.	70.	6.
262	163.	17.	55.	6.	11.	11.	60.	6.	15.	14.	85.	6.	99.0	17.	80.	7.	21.	17.	95.	8.
272	100.	9.	20.	3.	6.	8.	50.	5.	17.	17.	70.	7.	96.0	11.	30.	3.	7.	7.	5.	2.
282	136.	12.	45.	6.	10.	9.	55.	5.	14.	13.	45.	5.	99.0	17.	80.	7.	23.	17.	98.	9.
292	75.	8.	5.	1.	6.	7.	15.	4.	13.	12.	25.	4.	99.0	17.	90.	7.	21.	17.	80.	6.
302	130.	11.	30.	4.	10.	9.	60.	6.	13.	12.	45.	4.	100.0	17.	98.	9.	18.	14.	40.	4.

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	01-1	01-2	01-3	01-4	02-1	U2-2	02-3	02-4	03-1	03-2	03-3	03-4	04-1	04-2	04-3	04-4
011	1.9	5.	4.7	-2.8	3.7	43.	4.6	-0.9	2.9	21.	4.5	-1.6	2.9	20.	4.6	-1.7
021	2.9	21.	3.4	-0.5	2.5	17.	3.2	-0.7	4.1	46.	3.3	0.8	3.3	29.	3.3	0.0
031	8.7	96.	5.0	3.7	4.8	41.	5.3	-1.3	4.1	48.	5.0	-0.9	5.0	70.	5.1	-0.1
041	4.2	51.	4.6	-0.4	5.7	74.	4.8	0.9	5.6	81.	4.9	0.7	5.0	70.	4.8	0.2
051	3.9	46.	2.5	1.4	2.0	8.	1.9	0.1	1.9	5.	2.2	-0.3	2.5	11.	2.1	0.4
061	3.0	21.	2.9	0.1	2.7	27.	3.0	-0.3	3.0	21.	2.9	0.1	2.8	20.	2.9	-0.1
071	2.0	15.	3.4	-1.4	3.8	39.	4.3	-0.5	2.9	14.	4.1	-1.2	2.7	18.	3.9	-1.5
081	5.4	27.	8.1	-2.7	6.0	35.	7.8	-4.5	5.0	18.	7.6	-2.6	5.3	23.	7.8	-2.5
091	10.2	79.	10.4	-0.2	5.4	29.	10.2	-4.8	8.3	66.	9.9	-1.6	7.6	58.	10.0	-2.4
101	7.5	54.	8.5	-1.0	10.6	84.	8.9	1.7	8.8	71.	8.7	0.1	9.0	74.	8.6	0.4
111	3.9	46.	7.0	-3.1	5.3	69.	7.1	-1.8	9.4	99.	7.2	2.2	5.4	78.	7.1	-1.7
121	2.6	15.	4.7	-2.1	4.6	59.	5.4	-0.8	5.3	75.	4.5	0.8	4.1	51.	4.8	-0.7
131	10.2	70.	10.0	0.2	8.0	50.	6.7	1.3	6.1	25.	-6.8	-0.7	7.4	42.	6.9	0.5
141	6.5	41.	6.5	0.0	8.6	66.	6.6	2.0	5.2	22.	-6.7	-0.5	6.4	40.	6.5	-0.1
151	7.5	54.	6.1	1.4	6.0	35.	6.7	-0.7	5.2	22.	6.8	-1.6	6.5	38.	6.9	-0.4
162	3.9	46.	4.7	-0.8	6.1	79.	5.0	1.1	5.3	75.	4.7	0.6	5.0	69.	4.9	0.1
172	6.1	82.	5.2	0.9	4.6	59.	5.7	-1.1	4.8	64.	4.9	-0.1	5.1	72.	5.2	-0.1
182	6.1	82.	5.6	0.5	9.8	98.	6.5	3.3	5.6	81.	5.3	0.3	6.9	93.	5.8	1.1
192	3.4	34.	5.1	-1.7	4.6	59.	5.0	-0.4	3.3	32.	4.6	-1.3	3.6	39.	4.9	-1.3
202	2.3	12.	2.5	-0.2	5.7	74.	2.7	3.0	2.6	13.	2.3	0.3	3.3	29.	2.2	1.1
212	11.7	99.	5.6	6.1	11.9	99.	6.7	5.2	11.9	99.	5.5	6.4	11.9	99.	6.0	5.9
222	2.9	21.	4.9	-2.0	3.4	37.	5.1	-1.7	2.6	13.	5.0	-2.4	2.9	20.	5.0	-2.1
232	4.3	14.	9.4	-5.1	6.0	35.	9.6	3.6	7.1	50.	9.2	-2.1	5.7	30.	9.3	-3.6
242	8.4	62.	13.6	-5.2	7.4	54.	13.6	-6.2	5.8	31.	13.3	-7.5	6.9	46.	13.5	-6.6
252	11.5	87.	8.7	2.8	12.9	97.	10.2	2.7	9.9	81.	9.2	0.7	11.7	94.	9.2	2.5
262	8.7	77.	7.1	1.6	10.7	92.	7.2	3.5	7.0	64.	6.8	0.2	8.8	84.	7.3	1.5
272	10.2	79.	12.3	-2.1	12.9	95.	13.0	-0.1	6.5	40.	11.4	-4.9	9.0	74.	11.7	-2.7
282	12.9	98.	10.0	2.9	12.9	98.	11.2	1.7	7.0	49.	6.8	0.2	10.7	91.	10.2	0.5
292	9.5	79.	6.3	3.2	9.3	80.	6.2	3.1	6.4	58.	6.2	0.2	8.4	72.	6.2	2.2
302	10.2	79.	10.0	0.2	12.9	99.	11.2	1.7	12.9	99.	10.2	2.7	12.9	99.	10.2	2.7

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS.

A	P1-1	P1-2	P1-3	P1-4	P2-1	P2-2	P2-3	P2-4	P3-1	P3-2	P3-3	P3-4	Q	R
011	1.9	5.	4.7	-2.8	3.7	43.	4.6	-0.9	2.9	21.	4.5	-1.6	3	CABINET MAKER
021	2.9	21.	3.4	-0.5	2.5	17.	3.2	-0.7	4.1	48.	3.3	0.8	3	MARINE MACHINIST, FOREMAN
031	8.7	96.	5.0	3.7	4.8	41.	5.3	-1.3	4.1	48.	5.0	-0.9	1	ATTORNEY
041	4.2	51.	4.6	-0.4	5.7	74.	4.8	0.9	5.6	81.	4.9	0.7	1	TEACHER
051	3.9	46.	2.5	1.4	2.0	8.	1.9	0.1	1.9	5.	2.2	-0.3	3	SALESMAN
061	3.0	21.	2.9	0.1	2.7	27.	3.0	-0.3	3.0	21.	2.9	0.1	3	MANAGER: PARTS DEPARTMENT
071	2.0	15.	3.4	-1.4	3.8	39.	4.3	-0.5	2.9	14.	4.1	-1.2	3	LAW ENFORCEMENT OFFICIAL
081	5.4	27.	8.1	-2.7	6.0	35.	7.8	-4.5	5.0	18.	7.6	-2.6	4	LOGICON CO. WORKER
091	10.2	79.	10.4	-0.2	5.4	29.	10.2	-4.8	8.3	66.	9.9	-1.6	3	TRACY CO. EMPLOYEE
101	7.5	54.	8.5	-1.0	10.6	84.	8.9	1.7	8.8	71.	8.7	0.1	1	PHYSICIAN
111	3.9	46.	7.0	-3.1	5.3	69.	7.1	-1.8	9.4	99.	7.2	2.2	3	CONTRACTOR: AUTO UPHS
121	2.6	15.	4.7	-2.1	4.6	59.	5.4	-0.8	5.3	75.	4.5	0.8	3	X-RAY + LAB TECHNICIAN
131	10.2	70.	10.0	0.2	8.0	50.	6.7	1.3	6.1	25.	-6.8	-0.7	4	L. L. FOS: MANAGER
141	6.5	41.	6.5	0.0	8.6	66.	6.6	2.0	5.2	22.	-6.7	-0.5	3	FARM MANAGER
151	7.5	54.	6.1	1.4	6.0	35.	6.7	-0.7	5.2	22.	6.8	-1.6	1	PHARMACIST: OWNER
162	3.9	46.	4.7	-0.8	6.1	79.	5.0	1.1	5.3	75.	4.7	0.6	3	TRAILER CABINET MAKER
172	6.1	82.	5.2	0.9	4.6	59.	5.7	-1.1	4.8	64.	4.9	-0.1	3	LAB TECHNICIAN
182	6.1	82.	5.6	0.5	9.8	98.	6.5	3.3	5.6	81.	5.3	0.3	1	PHYSICIAN (RESIDENT)
192	3.4	34.	5.1	-1.7	4.6	59.	5.0	-0.4	3.3	32.	4.6	-1.3	1	TEACHER
202	2.3	10.	2.5	-0.2	5.7	74.	2.7	3.0	2.6	13.	2.3	0.3	3	SALESMAN
212	11.7	99.	5.6	6.1	11.9	99.	6.7	5.2	11.9	99.	5.5	6.4	3	X-RAY TECHNICIAN
222	2.9	21.	4.9	-2.0	3.4	37.	5.1	-1.7	2.6	13.	5.0	-2.4	3	LLU SCHOOL WORKER
232	4.3	14.	9.4	-5.1	6.0	35.	9.6	3.6	7.1	50.	9.2	-2.1	4	CONSTRUCTION CONTR. WORKER
242	8.4	62.	13.6	-5.2	7.4	54.	13.6	-6.2	5.8	31.	13.3	-7.5	3	LLF CO. EMPLOYEE
252	11.5	87.	8.7	2.8	12.9	97.	10.2	2.7	9.9	81.	9.2	0.7	1	DENTIST
262	8.7	77.	7.1	1.6	10.7	92.	7.2	3.5	7.0	64.	6.8	0.2	3	CONTRACTOR
272	10.2	79.	12.3	-2.1	12.9	95.	13.0	-0.1	6.5	40.	11.4	-4.9	3	LAB TECHNICIAN
282	12.9	98.	10.0	2.9	12.9	98.	11.2	1.7	7.0	49.	6.8	0.2	4	LAB TECHNICIAN (MANAGER-CHIEF)
292	9.5	79.	6.3	3.2	9.3	80.	6.2	3.1	6.4	58.	6.2	0.2	3	TECHNICIAN
302	10.2	79.	10.0	0.2	12.9	99.	11.2	1.7	12.9	99.	10.2	2.7	1	PHYSICIAN

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	S1	S2	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	U	V	W	X1	X2	Y
011	4	3	4	4	4	4	4	4	4	4	4	4	4	4	111	103	107	0	0	0
021	3	4	2	2	3	2	3	3	3	3	3	2	3	3	106	94	99	11	4	15
031	3	2	2	2	4	4	5	3	4	2	3	4	4	4	109	113	112	0	0	0
041	4	3	3	3	4	3	5	4	4	5	4	4	4	4	105	103	104	0	0	0
051	3	4	3	4	3	3	4	3	3	4	3	3	4	4	104	84	92	0	0	0
061	3	3	1	2	2	3	2	2	3	3	2	3	3	3	95	91	93	0	0	0
071	3	3	4	3	4	3	5	4	4	3	5	4	4	4	89	83	86	0	0	0
081	3	4	3	4	2	3	4	4	3	3	4	3	3	4	103	99	101	0	0	0
091	2	3	2	2	2	3	2	3	3	2	3	2	3	3	117	111	115	3	11	14
101	3	3	3	1	3	3	3	3	3	3	2	3	3	3	110	114	114	0	0	0
111	3	4	3	2	2	3	4	4	3	3	4	3	3	3	111	111	111	11	4	15
121	2	3	1	2	2	3	1	3.	2	3	4	2	3	3	118	114	117	7	0	7
131	3	3	4	3	3	3	1	3	3	3	3	3	3	3	110	99	104	0	0	0
141	2	5	4	4	3	3	3	4	3	4	3	3	4	4	102	97	99	0	0	0
151	4	3	4	4	3	3	4	3	3	3	3	3	3	3	117	108	112	0	0	0
162	2	2	3	2	1	1	1	2	2	2	2	2	3	2	115	128	124	0	0	0
172	1	2	2	4	3	2	2	4	4	1	2	3	3	3	110	110	109	0	0	0
182	1	2	1	1	1	1	1	1	2	3	1	2	2	2	108	125	117	0	11	11
192	3	3	3	2	3	4	3	4	4	1	2	4	4	4	101	96	98	0	0	0
202	2	3	3	3	3	4	3	3	4	2	3	3	3	4	104	108	107	0	0	0
212	1	1	2	2	1	2	2	3	3	5	2	2	3	3	97	128	108	0	0	3
222	3	3	3	4	3	4	5	4	4	4	4	4	4	4	90	93	91	0	0	0
232	3	2	4	2	3	4	3	4	4	3	2	4	3	2	105	110	108	0	0	0
242	1	1	2	3	1	2	2	4	3	5	5	2	3	3	121	131	131	0	0	0
252	1	1	2	1	3	2	1	2	2	3	2	2	2	2	103	124	118	11	0	11
262	2	3	4	2	1	1	1	3	2	4	3	3	2	3	108	121	121	0	0	0
272	3	3	4	1	1	2	1	4	3	2	2	3	3	3	117	115	117	0	0	0
282	1	1	2	2	2	2	2	3	3	5	4	3	3	4	110	124	121	0	0	0
292	2	3	3	2	3	3	3	3	3	2	1	3	3	3	98	96	96	0	0	0
302	1	1	3	3	3	3	3	2	3	4	4	4	3	4	120	120	122	0	0	0

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            RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

  A    Z 1- 1 Z 1- 2 Z 1- 3 Z 1- 4 Z 1- 5 Z 1- 6 Z 1- 7 Z 1- 8 Z 1- 9 Z 1-10 Z 1-11 Z 1-12

 011     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 021     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 031     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 041     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 051     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 061     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 071     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 081     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 091     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 101     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0
 111     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 121     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 131     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 141     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 151     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 162     3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0    3.0    3.0    3.0    3.0
 172     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 182     3.0    3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0    3.0    3.0    3.0
 192     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 202     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 212     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 222     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 232     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 242     3.0    3.0    3.0    3.0    3.0    3.0    3.0    2.0    3.0    3.0    3.0    3.0
 252     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 262     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 272     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 282     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 292     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 302     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
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                  RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

  A    Z 2- 1 Z 2- 2 Z 2- 3 Z 2- 4 Z 2- 5 Z 2- 6 Z 2- 7 Z 2- 8 Z 2- 9 Z 2-10 Z 2-11 Z 2-12

 011     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 021     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 031     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 041     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 051     3.0    3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0    3.0    3.0    3.0
 061     3.0    3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0    3.0    3.0    3.0
 071     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 081     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 091     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    2.0    3.0    3.0
 101     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 111     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 121     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 131     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 141     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 151     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 162     3.0    3.0    2.5    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 172     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 182     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 192     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 202     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 212     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 222     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 232     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 242     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 252     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 262     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 272     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 282     3.0    3.0    3.0    3.0    3.0    3.0    3.0    2.5    3.0    3.0    3.0    3.0
 292     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0
 302     3.0    3.0    3.0    3.0    3.0    3.0    3.0    3.0    2.0    3.0    3.0    3.0
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RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 3- 1	Z 3- 2	Z 3- 3	Z 3- 4	Z 3- 5	Z 3- 6	Z 3- 7	Z 3- 8	Z 3- 9	Z 3-10	Z 3-11	Z 3-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 4- 1	Z 4- 2	Z 4- 3	Z 4- 4	Z 4- 5	Z 4- 6	Z 4- 7	Z 4- 8	Z 4- 9	Z 4-10	Z 4-11	Z 4-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 5- 1	Z 5- 2	Z 5- 3	Z 5- 4	Z 5- 5	Z 5- 6	Z 5- 7	Z 5- 8	Z 5- 9	Z 5-10	Z 5-11	Z 5-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	2.5	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.5	2.0	2.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0
141	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	2.5	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	2.5	3.0	3.0
272	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	2.5	3.0	3.0	2.5	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
322	3.0	3.0	3.0	2.5	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 6- 1	Z 6- 2	Z 6- 3	Z 6- 4	Z 6- 5	Z 6- 6	Z 6- 7	Z 6- 8	Z 6- 9	Z 6-10	Z 6-11	Z 6-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 7- 1	Z 7- 2	Z 7- 3	Z 7- 4	Z 7- 5	Z 7- 6	Z 7- 7	Z 7- 8	Z 7- 9	Z 7-10	Z 7-11	Z 7-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	2.0	3.0	3.0	2.5	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	2.5	3.0	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0
272	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 8- 1	Z 8- 2	Z 8- 3	Z 8- 4	Z 8- 5	Z 8- 6	Z 8- 7	Z 8- 8	Z 8- 9	Z 8-10	Z 8-11	Z 8-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z 9- 1	Z 9- 2	Z 9- 3	Z 9- 4	Z 9- 5	Z 9- 6	Z 9- 7	Z 9- 8	Z 9- 9	Z 9-10	Z 9-11	Z 9-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z10- 1	Z10- 2	Z10- 3	Z10- 4	Z10- 5	Z10- 6	Z10- 7	Z10- 8	Z10- 9	Z10-10	Z10-11	Z10-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z11- 1	Z11- 2	Z11- 3	Z11- 4	Z11- 5	Z11- 6	Z11- 7	Z11- 8	Z11- 9	Z11-10	Z11-11	Z11-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	2.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	2.0	3.0	3.0	3.0	2.5	2.5	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	2.5	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNCTIONS

A	Z12- 1	Z12- 2	Z12- 3	Z12- 4	Z12- 5	Z12- 6	Z12- 7	Z12- 8	Z12- 9	Z12-10	Z12-11	Z12-12
011	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
021	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
031	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
041	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
051	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
061	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
071	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
081	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
091	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
101	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
111	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
121	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
131	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
141	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
151	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
162	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
172	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
182	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
192	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
202	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
212	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
222	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
232	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
242	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
252	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
262	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
272	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
282	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0
292	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
302	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0

EXPLANATION OF LETTER CODE SYMBOLS FOR EACH COLUMN OF RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNTIONS

A NUMBER OF SUBJECT

B ID NUMBER - ENTRY AGE CLASS + GRADE LEVEL

C SEX OF SUBJECT 1 = MALE 2 = FEMALE

D CHRONOLOGICAL ENTRY AGE TO FIRST GRADE COMPUTED IN MONTHS

E PRESENT CHRONOLOGICAL AGE COMPUTED IN MONTHS

F NUMBER OF SCHOOL ATTENDED

G GILMORE READING TEST - ACCURACY

1 RAW SCORE
2 STANINE
3 GRADE EQUIVALENT
4 RATING

H GILMORE READING TEST - COMPREHENSION

1 RAW SCORE
2 STANINE
3 GRADE EQUIVALENT
4 RATING

I GILMORE READING TEST - RATE

1 NUMBER OF WORDS
2 TIME
3 STANINE
4 RAW SCORE
5 RATING

J PICTURE STORY LANGUAGE TEST - WORDS

1 RAW SCORE
2 AGE EQUIVALENT
3 PERCENTILE
4 STANINE

EXPLANATION OF LETTER CODE SYMBOLS FOR EACH COLUMN OF RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNTIONS

K PICTURE STORY LANGUAGE TEST - TOTAL SENTENCES

1 RAW SCORE
2 AGE EQUIVALENT
3 PERCENTILE
4 STANINE

L PICTURE STORY LANGUAGE TEST - WORDS PER SENTENCE

1 RAW SCORE
2 AGE EQUIVALENT
3 PERCENTILE
4 STANINE

M PICTURE STORY LANGUAGE TEST - SYNTAX QUOTIENT

1 RAW SCORE
2 AGE EQUIVALENT
3 PERCENTILE
4 STANINE

N PICTURE STORY LANGUAGE TEST - ABSTRACT - CONCRETE

1 RAW SCORE
2 AGE EQUIVALENT
3 PERCENTILE
4 STANINE

O LANGUAGE - CAL. TEST OF MENTAL MATURITY

1 MECHANICS
2 EXPRESSION
3 SPELLING
4 TOTAL LANGUAGE

-1 GRADE EQUIVALENT
-2 NATIONAL PERCENTILE
-3 ANTICIPATED GRADE EQUIVALENT
-4 GRADE EQUIVALENT DIFFERENCE

EXPLANATION OF LETTER CODE SYMBOLS FOR EACH COLUMN OF RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNTIONS

P READING - CAL. TEST OF MENTAL MATURITY

  1 VOCABULARY SCORES
  2 COMPREHENSION
  3 TOTAL SCORES

    -1 GRADE EQUIVALENT
    -2 NATIONAL PERCENTILE
    -3 ANTICIPATED GRADE EQUIVALENT
    -4 GRADE EQUIVALENT DIFFERENCE

Q SOCIO - ECONOMIC STATUS RATING

R OCCUPATION OF PARENT

S TEACHER'S RATINGS

  1 SPEECH INFLECTION PRODUCTION
  2 GEN. LANGUAGE DEVELOPMENT

T RATINGS OF SPEECH INFLECTION PRODUCTION

RATER NUMBER
*WITH EXPERIENCE

1
2
3
4
5
6
7

*WITHOUT EXPERIENCE

8
9
10
11
12

U NON - LANGUAGE IQ

V LANGUAGE IQ

W TOTAL IQ

EXPLANATION OF LETTER CODE SYMBOLS FOR EACH COLUMN OF RAW DATA FOR ANALYSIS IN PILOT STUDY OF LINGUISTIC FUNTIONS

X ARTICULATION ERRORS

1 SUBSTITUTION
2 DISTORTION

Y TOTAL ARTICULATION ERRORS

Z VOWEL PRODUCTION

VOWEL NUMBER

1 JOE (O) /o/.
2 TOOK (U) /u/.
3 FATHERS (A) /ɑ/.
4 SHOE (U) /U/.
5 BENCH (E) /ɛ/.
6 OUT (AU) /ɑu/.
7 AND (A) /æ/.
8 LAID (EI) /eɪ/.
9 IT (I) /ɪ/.
10 THE (E) /ə/.
11 LAWN (AW) /ɔ/.
12 FATHERS (ER) /ə/.

RATER NUMBER
*WITH EXPERIENCE

- 1
- 2
- 3
- 4
- 5
- 6
- 7

*WITHOUT EXPERIENCE

- 8
- 9
- 10
- 11
- 12

APPENDIX 3. STATISTICAL TABLES OF LINGUISTIC VARIABLES

TABLE 1

SUBJECTS: EARLY ENTRANTS GROUP

IDENTIFYING NUMBER		GRADE	NON-LANGUAGE IQ	LANGUAGE IQ	TOTAL IQ	SES	PARENTAL OCCUPATION	SEX (M F) (1 2)		SCHOOL 1	2	3	4
1	011	E41	111.00	103.00	107.00	3.00	CABINET MAKER	1				3	
2	021	E42	106.00	94.00	99.00	3.00	MARINE MACHINIST, FOREMAN		2			3	
3	031	E43	109.00	113.00	112.00	1.00	ATTORNEY		2			3	
4	041	E44	105.00	103.00	104.00	1.20	TEACHER	1				3	
5	051	E45	104.00	84.00	92.00	3.00	SALESMAN		2	1			
6	061	E46	95.00	91.00	93.00	3.00	MANAGER: PARTS DEPARTMENT		2			3	
7	071	E51	89.00	83.00	86.00	3.00	LAW ENFORCEMENT OFFICIAL	1				3	
MEANS GRADE 4 = 6 GRADE 5 = 1			102.71	95.86	99.00	2.43							
8	081	E71	103.00	99.00	101.00	4.00	LOGICON CO. WORKER	1		1			
9	091	E72	117.00	111.00	115.00	3.00	TRACY CO. EMPLOYEE	1		1			
10	101	E73	110.00	114.00	114.00	1.00	PHYSICAN		2	1			
11	111	E74	111.00	111.00	111.00	3.00	CONTRACTOR: AUTO UPHS		2				4
12	121	E75	118.00	114.00	117.00	3.00	X-RAY & LAB TECHNICIAN	1				3	
13	131	E81	112.00	99.00	104.00	4.00	L. L. FDS: MANAGER		2				4
14	141	E82	102.00	97.00	99.00	3.00	FARM MANAGER		2				4
15	151	E83	117.00	108.00	112.00	1.00	PHARMICIST: OWNER		2			3	
MEANS GRADE 7 = 5 GRADE 8 = 3			111.38	106.63	109.13	2.75							
TOTAL MEANS			107.13	101.60	104.40	2.60		6	9	4	0	8	3

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TABLE 2

SUBJECTS: LATE ENTRANTS GROUP

	IDENTIFYING NUMBER	GRADE	NON-LANGUAGE IQ	LANGUAGE IQ	TOTAL IQ	SES	PARENTAL OCCUPATION	SEX (M F) (1	2)	SCHOOL 1	2	3	4
1	162	L41	115.00	128.00	124.00	3.00	TRAILER CABINET MAKER	1					4
2	172	L42	110.00	110.00	107.00	3.00	LAB TECHNICIAN		2		2		
3	182	L43	108.00	125.00	117.00	1.00	PHYSICIAN (RESIDENT)		2	1			
4	192	L44	101.00	96.00	98.00	1.00	TEACHER	1			2		
5	202	L45	104.00	108.00	107.00	3.00	SALESMAN		2		2		
6	212	L46	97.00	128.00	108.00	3.00	X-RAY TECHNICIAN		2		2		
7	222	L51	90.00	63.00	91.00	3.00	LLU SCHOOL WORKER	1		1			
MEANS			103.57	108.29	107.43	2.43							
GRADE 4 = 6													
GRADE 5 = 1													
8	232	L71	105.00	110.00	108.00	4.00	CONSTRUCTION CONTR. WORKER	1		1			
9	242	L72	121.00	131.00	131.00	3.00	LLF CO. EMPLOYEE	1			2		
10	252	L73	103.00	124.00	118.00	1.00	DENTIST		2		2		
11	262	L74	102.00	121.00	122.00	3.00	CONTRACTOR		2				4
12	272	L75	117.00	115.00	117.00	3.00	LAB TECHNICIAN	1		1			
13	282	L81	110.00	124.00	121.00	4.00	LAB TECHNICIAN (MANAGER-CHIEF)		2				4
14	292	L82	98.00	96.00	96.00	3.00	TECHNICIAN		2				4
15	301	L83	124.00	120.00	122.00	1.00	PHYSICIAN		2		2		
MEANS			110.25	117.63	116.88	2.75							
GRADE 7 = 5													
GRADE 8 = 3													
TOTAL MEANS			107.13	113.27	112.47	2.60		6	9	4	7	0	4

```
                                TABLE  3

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                        UNDER GROUPS OF SCORES OF:

 ===========================================================================
   1.  NON-LANGUAGE INTELLIGENCE QUOTIENT: (CTMM SH.FM. TEST ACAD. APT.).
 ---------------------------------------------------------------------------

                          EE          LE           XBAR   SEX

                 1      111.00      115.00       113.00   M
                 2      106.00      110.00       108.00   F
                 3      109.00      108.00       108.50   F
                 4      105.00      101.00       103.00   M
                 5      104.00      104.00       104.00   F
                 6       95.00       97.00        96.00   F
                 7       89.00       90.00        89.50   M

         MEANS          102.71      103.57

                 8      103.00      105.00       104.00   M
                 9      117.00      121.00       119.00   M
                10      110.00      103.00       106.50   F
                11      111.00      108.00       109.50   F
                12      118.00      117.00       117.50   M
                13      110.00      110.00       110.00   F
                14      102.00       98.00       100.00   F
                15      117.00      120.00       118.50   F

         MEANS          111.00      110.25
   TOTAL MEANS          107.13      107.13       107.13
                                 GROUP
                SOURCE          SS         DF          MS
                GROUP          0.00         1         0.00
                SUBJECT     1922.47        14       135.89
                ERROR         79.00        14         5.64
                TOTAL       1981.46        29
                GROUP F        0.00      DF =  1,14
                SUBJECT F     24.08      DF = 14,14

                EE>VS LE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                              GIRLS
 SOURCE          SS        DF         MS         SS          DF          MS
 GROUP          3.00        1        3.00       2.00          1         2.00
 SUBJECT     1237.67        5      247.53     659.11          8        82.39
 ERROR         24.00        5        4.80      50.00          8         6.25
 TOTAL       1264.67       11                 711.11         17
 GROUP F        0.63      DF =  1, 5            0.32       DF =  1, 8
 SUBJECT F     51.57      DF =  5, 5           13.18       DF =  8, 8

 LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
 ===========================================================================
                                TABLE  4

      FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

======================================================================
  2.  LANGUAGE INTELLIGENCE QUOTIENT: (CTMM SH. FM. TEST ACAD. APT.).
----------------------------------------------------------------------

                         EE         LE          XBAR   SEX

                 1     103.00     128.00      115.50    M
                 2      94.00     110.00      102.00    F
                 3     113.00     125.00      119.00    F
                 4     103.00      96.00       99.50    M
                 5      84.00     108.00       96.00    F
                 6      91.00     128.00      109.50    F
                 7      83.00      93.00       88.00    M

           MEANS        95.86     112.57

                 8      99.00     110.00      104.50    M
                 9     111.00     131.00      121.00    M
                10     114.00     124.00      119.00    F
                11     111.00     121.00      116.00    F
                12     114.00     115.00      114.50    M
                13      99.00     124.00      111.50    F
                14      97.00      96.00       96.50    F
                15     108.00     120.00      114.00    F

           MEANS       106.63     117.63
     TOTAL MEANS       101.60     115.27      108.43
                                GROUP
               SOURCE          SS          DF          MS
               GROUP         1400.84        1       1400.84
               SUBJECT       2835.87       14        202.56
               ERROR          904.66       14         64.62
               TOTAL         5141.37       29
               GROUP F         21.68      DF =  1,14
               SUBJECT F        3.13      DF = 14,14

               LE>VS EE  SIGNIFICANT AT .05 LEVEL

                         BOYS                              GIRLS
 SOURCE          SS       DF          MS         SS         DF          MS
 GROUP        300.00       1       300.00     1168.06        1     1168.06
 SUBJECT     1495.67       5       299.13     1308.11        8      163.51
 ERROR        348.00       5        69.60      489.44        8       61.18
 TOTAL       2143.67      11                  2965.61       17
 GROUP F        4.31     DF =  1, 5             19.09     DF =  1, 8
 SUBJECT F      4.30     DF =  5, 5              2.67     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
======================================================================
```

TABLE 5

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
*******************************************************************************
 3.  TOTAL INTELLIGENCE QUOTIENT: (CTMM SF, FM, TEST ACADEMIC APTITUDE).
-------------------------------------------------------------------------------

                            EE           LE            XBAR    SEX

                   1      107.00       124.00        115.50     M
                   2       99.00       109.00        104.00     F
                   3      112.00       117.00        114.50     F
                   4      104.00        98.00        101.00     M
                   5       92.00       107.00         99.50     F
                   6       93.00       108.00        100.50     F
                   7       86.00        91.00         88.50     M

          MEANS            99.00       107.71

                   8      101.00       108.00        104.50     M
                   9      115.00       131.00        123.00     M
                  10,     114.00       118.00        116.00     F
                  11      111.00       121.00        116.00     F
                  12      117.00       117.00        117.00     M
                  13      104.00       121.00        112.50     F
                  14       99.00        96.00         97.50     F
                  15      112.00       122.00        117.00     F

          MEANS           109.13       116.75
    TOTAL MEANS           104.40       112.53        108.47
                                   GROUP
                 SOURCE         SS          DF         MS
                 GROUP        496.13         1       496.13
                 SUBJECT     2653.47        14       189.53
                 ERROR        375.87        14        26.85
                 TOTAL       3525.46        29
                 GROUP F       18.48        DF =  1,14
                 SUBJECT F      7.06        DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                              BOYS                               GIRLS
 SOURCE           SS         DF          MS          SS          DF          MS
 GROUP          126.75        1        126.75      382.72         1       382.72
 SUBJECT       1606.75        5        321.35     1045.78         8       130.72
 ERROR          200.75        5         40.15      161.78         8        20.22
 TOTAL         1934.25       11                   1590.28        17
 GROUP F          3.16       DF =  1, 5             18.93        DF =  1, 8
 SUBJECT F        8.00       DF =  5, 5              6.46        DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
*******************************************************************************
```

```
                              TABLE  6

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                   UNDER GROUPS OF SCORES OF:

=======================================================================
       4.   CHRONOLOGICAL ENTRY AGE TO FIRST GRADE OF SUBJECT
                   COMPUTED IN TERMS OF MONTHS.
-----------------------------------------------------------------------

                         EE          LE           XBAR  SEX

                 1     63.00       89.00         76.00   M
                 2     69.00       83.00         76.00   F
                 3     71.00       84.00         77.50   F
                 4     71.00       84.00         77.50   M
                 5     71.00       86.00         78.50   F
                 6     74.00       89.00         81.50   F
                 7     67.00       91.00         79.00   M

          MEANS        69.43       86.57

                 8     71.00       84.00         77.50   M
                 9     71.00       83.00         77.00   M
                10     71.00       89.00         80.00   F
                11     71.00       85.00         78.00   F
                12     72.00       92.00         82.00   M
                13     72.00       83.00         77.50   F
                14     75.00       88.00         81.50   F
                15     75.00       83.00         79.00   F

          MEANS        72.25       85.88
    TOTAL MEANS        70.93       86.20         78.57
                                 GROUP
               SOURCE        SS           DF          MS
               GROUP       1748.03         1       1748.03
               SUBJECT      103.87        14          7.42
               ERROR        163.47        14         11.68
               TOTAL       2015.37        29
               GROUP F      149.71       DF =  1,14
               SUBJECT F      0.64       DF = 14,14
               LE>VS. EE SIGNIFICANT AT .05 LEVEL

                             BOYS                                 GIRLS
SOURCE              SS        DF         MS             SS         DF          MS
GROUP            972.00        1       972.00         813.39        1       813.39
SUBJECT           44.67        5         8.93          56.00        8         7.00
ERROR             95.00        5        19.00          31.11        8         3.89
TOTAL           1111.67       11                      900.50       17
GROUP F           51.16       DF =  1, 5              209.16       DF =  1, 8
SUBJECT F          0.47       DF =  5, 5                1.80       DF =  8, 8

LE>VS. EE SIGNIFICANT AT .05 LEVEL      LE>VS. EE SIGNIFICANT AT .05 LEVEL
==================================================================================
```

TABLE 7

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
=========================================================================
   5.  PRESENT CHRONOLOGICAL AGE OF SUBJECT COMPUTED IN TERMS OF MONTHS
-------------------------------------------------------------------------

                            EE          LE          XBAR   SEX

                  1       111.00      125.00      118.00    M
                  2       105.00      119.00      112.00    F
                  3       107.00      120.00      113.50    F
                  4       107.00      120.00      113.50    M
                  5       107.00      122.00      114.50    F
                  6       110.00      125.00      117.50    F
                  7       127.00      139.00      133.00    M

          MEANS           110.57      124.29

                  8       143.00      156.00      149.50    M
                  9       143.00      155.00      149.00    M
                 10       143.00      161.00      152.00    F
                 11       143.00      157.00      150.00    F
                 12       144.00      164.00      154.00    M
                 13       156.00      167.00      161.50    F
                 14       159.00      172.00      165.50    F
                 15       159.00      167.00      163.00    F

          MEANS           148.75      162.38
    TOTAL MEANS           130.93      144.60      137.77
                                    GROUP
                SOURCE          SS          DF          MS
                GROUP        1400.84         1       1400.84
                SUBJECT     12111.87        14        865.13
                ERROR          54.66        14          3.90
                TOTAL       13567.37        29
                GROUP F       358.76       DF =  1,14
                SUBJECT F     221.57       DF = 14,14
                LE>VS. EE SIGNIFICANT AT .05 LEVEL

                           BOYS                                GIRLS
SOURCE            SS        DF          MS           SS         DF          MS
GROUP           588.00       1        588.00       813.39        1       813.39
SUBJECT        3028.67       5        605.73      9032.04        8      1129.00
ERROR            23.00       5          4.60        31.11        8         3.89
TOTAL          3639.67      11                    9876.53       17
GROUP F         127.83      DF =  1, 5            209.17      DF =  1, 8
SUBJECT F       131.68      DF =  5, 5            290.33      DF =  8, 8

LE>VS. EE SIGNIFICANT AT .05 LEVEL      LE>VS. EE SIGNIFICANT AT .05 LEVEL
=========================================================================
                                TABLE  8

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                          UNDER GROUPS OF SCORES OF:

===========================================================================
 6.  SOCIO-ECONOMIC STATUS (WARNER REVISED RATING SCALE FOR OCCUPATION).
---------------------------------------------------------------------------

                         EE           LE          XBAR   SEX

                 1       3.00         3.00         3.00   M
                 2       3.00         3.00         3.00   F
                 3       1.00         1.00         1.00   F
                 4       1.00         1.00         1.00   M
                 5       3.00         3.00         3.00   F
                 6       3.00         3.00         3.00   F
                 7       3.00         3.00         3.00   M

           MEANS         2.43         2.43

                 8       4.00         4.00         4.00   M
                 9       3.00         3.00         3.00   M
                10       1.00         1.00         1.00   F
                11       3.00         3.00         3.00   F
                12       3.00         3.00         3.00   M
                13       4.00         4.00         4.00   F
                14       3.00         3.00         3.00   F
                15       1.00         1.00         1.00   F

           MEANS         2.75         2.75
     TOTAL MEANS         2.60         2.60         2.60
                                  GROUP
               SOURCE         SS          DF          MS
               GROUP         0.00          1         0.00
               SUBJECT      31.20         14         2.23
               ERROR         0.00         14         0.01
               TOTAL        31.20         29
               GROUP F       0.00       DF =  1,14
               SUBJECT F   222.86       DF = 14,14

               EE>VS LE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                                GIRLS
 SOURCE           SS        DF          MS           SS         DF          MS
 GROUP           0.00        1         0.00         0.00         1         0.00
 SUBJECT         9.67        5         1.93        20.44         8         2.56
 ERROR           0.00        5         0.01         0.00         8         0.01
 TOTAL           9.67       11                     20.44        17
 GROUP F         0.00       DF =  1, 5              0.00       DF =  1, 8
 SUBJECT F     193.33       DF =  5, 5            255.56       DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
===========================================================================
```

TABLE 9

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
**********************************************************************
                        (GRADE EQUIVALENTS)
7.  MECHANICS OF ENGLISH LANGUAGE (CTMM SH, FM, ACADEMIC APTITUDE TEST).
----------------------------------------------------------------------

                         EE          LE         XBAR   SEX

                 1      1.90        3.90        2.90    M
                 2      2.90        6.10        4.50    F
                 3      8.70        6.10        7.40    F
                 4      4.20        3.40        3.80    M
                 5      3.90        2.30        3.10    F
                 6      3.00       11.70        7.35    F
                 7      2.00        2.90        2.45    M

         MEANS          3.80        5.20

                 8      5.40        4.30        4.85    M
                 9     10.20        8.40        9.30    M
                10      7.50       11.50        9.50    F
                11      3.90        8.70        6.30    F
                12      2.60       10.20        6.40    M
                13     10.20       12.90       11.55    F
                14      6.50        9.50        8.00    F
                15      7.50       10.20        8.85    F

         MEANS          6.73        9.46
   TOTAL MEANS          5.36        7.47        6.42
                              GROUP
              SOURCE         SS         DF          MS
              GROUP         33.50        1        33.50
              SUBJECT      213.06       14        15.22
              ERROR         79.27       14         5.66
              TOTAL        325.82       29
              GROUP F        5.92      DF =  1,14
              SUBJECT F      2.69      DF = 14,14

              LE>VS EE  SIGNIFICANT AT .05 LEVEL

                         BOYS                                GIRLS
SOURCE          SS        DF         MS          SS         DF          MS
GROUP          3.85        1        3.85       34.40         1        34.44
SUBJECT       65.62        5       13.12      104.41         8        13.05
ERROR         29.98        5        6.00       44.49         8         5.56
TOTAL         99.45       11                  183.35        17
GROUP F        0.64     DF =  1, 5              6.19     DF =  1, 8
SUBJECT F      2.19     DF =  5, 5              2.35     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

TABLE 10

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

(NATIONAL PERCENTILE)

8. MECHANICS OF ENGLISH LANGUAGE (CTMM SH, FH, ACADEMIC APTITUDE TEST).

	EE	LE	XBAR	SEX
1	5.00	46.00	25.50	M
2	21.00	82.00	51.50	F
3	96.00	82.00	89.00	F
4	51.00	34.00	42.50	M
5	46.00	10.00	28.00	F
6	21.00	99.00	60.00	F
7	15.00	21.00	18.00	M
MEANS	36.43	53.43		
8	27.00	14.00	20.50	M
9	79.00	62.00	70.50	M
10	54.00	87.00	70.50	F
11	46.00	77.00	61.50	F
12	15.00	79.00	47.00	M
13	70.00	98.00	84.00	F
14	41.00	79.00	60.00	F
15	54.00	79.00	66.50	F
MEANS	48.25	71.88		
TOTAL MEANS	42.73	63.27	53.00	

GROUP

SOURCE	SS	DF	MS
GROUP	3162.13	1	3162.13
SUBJECT	14066.00	14	1004.71
ERROR	8217.87	14	586.99
TOTAL	25446.00	29	
GROUP F	5.39	DF = 1,14	
SUBJECT F	1.71	DF = 14,14	

LE>VS EE SIGNIFICANT AT .05 LEVEL

	BOYS			GIRLS		
SOURCE	SS	DF	MS	SS	DF	MS
GROUP	341.33	1	341.33	3307.56	1	3307.56
SUBJECT	4034.67	5	806.93	5122.44	8	640.31
ERROR	2938.67	5	587.73	4792.44	8	599.06
TOTAL	7314.67	11		13222.44	17	
GROUP F	0.58	DF = 1, 5		5.52	DF = 1, 8	
SUBJECT F	1.37	DF = 5, 5		1.07	DF = 8, 8	

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL

TABLE 11

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
*************************************************************************
                      (GRADE EQUIVALENTS)
9.  EXPRESSION OF ENGLISH LANGUAGE (CTMM SH, FM, ACADEMIC APTITUDE TEST).
-------------------------------------------------------------------------

                        EE            LE            XBAR    SEX

             1         3.70          6.10          4.90     M
             2         2.50          4.60          3.55     F
             3         4.80          9.80          7.30     F
             4         5.70          4.60          5.15     M
             5         2.00          5.70          3.85     F
             6         2.70         11.90          7.30     F
             7         3.80          3.40          3.60     M

        MEANS          3.60          6.59

             8         6.00          6.00          6.00     M
             9         5.40          7.40          6.40     M
            10        10.60         12.90         11.75     F
            11         5.30         10.70          8.00     F
            12         4.60         12.90          8.75     M
            13         8.00         12.90         10.45     F
            14         8.60          9.30          8.95     F
            15         6.00         12.90          9.45     F

        MEANS          6.81         10.63
  TOTAL MEANS          5.31          8.74          7.03
                                  GROUP
             SOURCE          SS          DF           MS
             GROUP         88.07          1          88.07
             SUBJECT      182.16         14          13.01
             ERROR         69.09         14           4.94
             TOTAL        339.32         29
             GROUP F       17.84       DF =  1,14
             SUBJECT F      2.64       DF = 14,14

             LE>VS EE  SIGNIFICANT AT .05 LEVEL

                      BOYS                                 GIRLS
SOURCE          SS         DF          MS          SS          DF          MS
GROUP         10.45         1        10.45        89.78         1        89.78
SUBJECT       30.35         5         6.07       121.71         8        15.21
ERROR         29.56         5         5.91        27.37         8         3.42
TOTAL         70.36        11                    238.86        17
GROUP F        1.77      DF =  1, 5               26.24      DF =  1, 8
SUBJECT F      1.03      DF =  5, 5                4.45      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
*************************************************************************
```

```
                              TABLE 12

      FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF:

=========================================================================
                          (NATIONAL PERCENTILE)
13.  EXPRESSION OF ENGLISH LANGUAGE (CTMM SH, FM, ACADEMIC APTITUDE TEST).
-------------------------------------------------------------------------

                            EE          LE         XBAR   SEX

                    1      43.00       79.00       61.00   M
                    2      17.00       59.00       38.00   F
                    3      41.00       98.00       69.50   F
                    4      74.00       59.00       66.50   M
                    5       8.00       74.00       41.00   F
                    6      27.00       99.00       63.00   F
                    7      39.00       37.00       38.00   M

           MEANS           35.57       72.14

                    8      35.00       35.00       35.00   M
                    9      29.00       54.00       41.50   M
                   10      84.00       97.00       90.50   F
                   11      69.00       92.00       80.50   F
                   12      59.00       95.00       77.00   M
                   13      50.00       98.00       74.00   F
                   14      66.00       80.00       73.00   F
                   15      35.00       99.00       67.00   F

           MEANS           53.38       81.25
     TOTAL MEANS           45.07       77.00       61.03
                                    GROUP
                 SOURCE           SS         DF          MS
                 GROUP          7648.03       1       7648.03
                 SUBJECT        8952.47      14        639.46
                 ERROR          4998.47      14        357.03
                 TOTAL         21598.97      29
                 GROUP F          21.42      DF =  1,14
                 SUBJECT F         1.79      DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                            BOYS                             GIRLS
  SOURCE          SS         DF          MS          SS          DF          MS
  GROUP         533.33        1        533.33     8844.50        1       8844.50
  SUBJECT      3006.67        5        601.33     4708.11        8        588.51
  ERROR        1189.67        5        237.93     2079.00        8        259.88
  TOTAL        4729.67       11                  15631.61       17
  GROUP F         2.24      DF =  1, 5              34.03      DF =  1, 8
  SUBJECT F       2.53      DF =  5, 5               2.26      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
=========================================================================
```

TABLE 13

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
**********************************************************************
                        (GRADE EQUIVALENTS)
11.  LANGUAGE DEVELOPMENT: SPELLING (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
----------------------------------------------------------------------

                      EE          LE         XBAR   SEX

              1       2.90        5.30        4.10   M
              2       4.10        4.80        4.45   F
              3       4.10        5.60        4.85   F
              4       5.60        3.30        4.45   M
              5       1.90        2.60        2.25   F
              6       3.80       11.90        7.85   F
              7       2.90        2.60        2.75   M

         MEANS        3.50        5.16

              8       5.00        7.10        6.05   M
              9       8.30        5.80        7.05   M
             10       8.80        9.90        9.35   F
             11       9.40        7.00        8.20   F
             12       5.30        6.50        5.90   M
             13       6.10        7.00        6.55   F
             14       5.20        6.40        5.80   F
             15       5.20       12.90        9.05   F

         MEANS        6.66        7.83
   TOTAL MEANS        5.19        6.58        5.88
                              GROUP
              SOURCE        SS         DF          MS
              GROUP        14.56        1        14.56
              SUBJECT     126.17       14         9.01
              ERROR        72.53       14         5.18
              TOTAL       213.26       29
              GROUP F       2.81      DF =  1,14
              SUBJECT F     1.74      DF = 14,14

              LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                  GIRLS
 SOURCE           SS        DF          MS           SS          DF          MS
 GROUP           0.03        1         0.03        22.89          1        22.89
 SUBJECT        24.55        5         4.91        87.73          8        10.97
 ERROR          11.59        5         2.32        52.58          8         6.57
 TOTAL          36.17       11                    163.20         17
 GROUP F         0.01       DF =  1, 5              3.48        DF =  1, 8
 SUBJECT F       2.12       DF =  5, 5              1.67        DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

```
                              TABLE 14

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                        UNDER GROUPS OF SCORES OF:

   ****************************************************************
                         (NATIONAL PERCENTILE)
 12.  LANGUAGE DEVELOPMENT: SPELLING (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
   ----------------------------------------------------------------

                           EE          LE          XBAR    SEX

                   1      21.00       75.00       48.00    M
                   2      48.00       64.00       56.00    F
                   3      48.00       81.00       64.50    F
                   4      81.00       32.00       56.50    M
                   5       5.00       13.00        9.00    F
                   6      21.00       99.00       60.00    F
                   7      14.00       13.00       13.50    M

          MEANS           34.00       53.86

                   8      18.00       50.00       34.00    M
                   9      66.00       31.00       48.50    M
                  10      71.00       81.00       76.00    F
                  11      99.00       64.00       81.50    F
                  12      75.00       40.00       57.50    M
                  13      25.00       49.00       37.00    F
                  14      22.00       58.00       40.00    F
                  15      22.00       99.00       60.50    F

          MEANS           49.75       59.00
    TOTAL MEANS           42.40       56.60       49.50
                                    GROUP
                SOURCE          SS           DF          MS
                GROUP         1512.30         1       1512.30
                SUBJECT      11528.04        14        823.43
                ERROR        11193.20        14        799.51
                TOTAL        24233.50        29
                GROUP F          1.89       DF =  1,14
                SUBJECT F        1.03       DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                                  GIRLS
     SOURCE          SS       DF          MS         SS           DF          MS
     GROUP         96.33       1        96.33     3389.39          1      3389.39
     SUBJECT     2798.00       5       559.60     7885.00          8       985.62
     ERROR       4299.67       5       859.93     4920.11          8       615.01
     TOTAL       7194.00      11                 16194.50         17
     GROUP F        0.11      DF =  1, 5             5.51         DF =  1, 8
     SUBJECT F      0.65      DF =  5, 5             1.60         DF =  8, 8

   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
   ****************************************************************
```

TABLE 15

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
*************************************************************************
                          (GRADE EQUIVALENTS)
13.  TOTAL GENERAL LANGUAGE DEVELOPMENT (CTMM SHORT FM TEST ACADEMIC APTITUDE).
-------------------------------------------------------------------------

                            EE          LE          XBAR   SEX

                    1      2.90        5.00         3.95   M
                    2      3.30        5.10         4.20   F
                    3      5.00        6.90         5.95   F
                    4      5.00        3.60         4.30   M
                    5      2.50        3.30         2.90   F
                    6      2.80       11.90         7.35   F
                    7      2.70        2.90         2.80   M

           MEANS           3.46        5.53

                    8      5.30        5.70         5.50   M
                    9      7.60        6.90         7.25   M
                   10      9.00       11.70        10.35   F
                   11      5.40        8.80         7.10   F
                   12      4.10        9.00         6.55   M
                   13      7.40       10.70         9.05   F
                   14      6.40        8.40         7.40   F
                   15      6.50       12.90         9.70   F

           MEANS           6.46        9.26
     TOTAL MEANS           5.06        7.52         6.29
                                 GROUP
                 SOURCE        SS          DF           MS
                 GROUP        45.39         1         45.39
                 SUBJECT     155.89        14         11.14
                 ERROR        52.65        14          3.76
                 TOTAL       253.93        29
                 GROUP F      12.07      DF =  1,14
                 SUBJECT F     2.96      DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                              BOYS                                GIRLS
SOURCE          SS          DF          MS            SS          DF          MS
GROUP          2.52          1         2.52         54.78          1        54.78
SUBJECT       28.25          5         5.65         97.30          8        12.16
ERROR         13.01          5         2.60         27.72          8         3.47
TOTAL         43.79         11                     179.80         17
GROUP F        2.97       DF =  1, 5                15.81       DF =  1, 8
SUBJECT F      2.17       DF =  5, 5                 3.51       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
*************************************************************************
```

TABLE 16

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
***********************************************************************************
                              (NATIONAL PERCENTILE)
14.  TOTAL GENERAL LANGUAGE DEVELOPMENT (CTMM SHORT FM TEST ACADEMIC APTITUDE).
-----------------------------------------------------------------------------------

                          EE            LE             XBAR    SEX

                   1     20.00         69.00          44.50    M
                   2     29.00         72.00          50.50    F
                   3     70.00         93.00          81.50    F
                   4     70.00         39.00          54.50    M
                   5     11.00         29.00          20.00    F
                   6     20.00         99.00          59.50    F
                   7     18.00         20.00          19.00    M

          MEANS          34.00         60.14

                   8     23.00         30.00          26.50    M
                   9     58.00         46.00          52.00    M
                  10     74.00         94.00          84.00    F
                  11     78.00         84.00          81.00    F
                  12     51.00         74.00          62.50    M
                  13     42.00         91.00          66.50    F
                  14     40.00         72.00          56.00    F
                  15     38.00         99.00          68.50    F

          MEANS          50.50         73.75
    TOTAL MEANS          42.80         67.40          55.10
                                   GROUP
                 SOURCE          SS           DF            MS
                 GROUP        4538.70          1        4538.70
                 SUBJECT     12168.20         14         869.16
                 ERROR        5767.86         14         411.99
                 TOTAL       22474.76         29
                 GROUP F        11.02        DF =  1,14
                 SUBJECT F       2.11        DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                               BOYS                                 GIRLS
 SOURCE          SS          DF          MS           SS           DF          MS
 GROUP         120.33         1        120.33      6086.72          1       6086.72
 SUBJECT      2887.67         5        577.53      6432.44          8        804.06
 ERROR        1923.67         5        384.73      2175.78          8        271.97
 TOTAL        4931.67        11                   14694.94         17
 GROUP F         0.31      DF =  1, 5                22.38       DF =  1, 8
 SUBJECT F       1.50      DF =  5, 5                 2.96       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
***********************************************************************************
```

TABLE 17

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
*************************************************************************
                         (GRADE EQUIVALENTS)
15.  SILENT READING VOCABULARY (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
-------------------------------------------------------------------------

                    EE          LE          XBAR   SEX

           1        3.90        9.10        6.50    M
           2        3.50        6.00        4.75    F
           3        3.70        6.80        5.25    F
           4        4.30        3.60        3.95    M
           5        3.20        6.00        4.60    F
           6        2.80       11.00        6.90    F
           7        2.30        1.80        2.05    M

      MEANS         3.39        6.33

           8        6.20        6.70        6.45    M
           9        8.20       12.90       10.55    M
          10        7.30        9.90        8.60    F
          11        5.30        9.90        7.60    F
          12        4.60       10.30        7.45    M
          13        7.70       10.10        8.90    F
          14        7.30        7.00        7.15    F
          15        8.50       12.90       10.70    F

      MEANS         6.89        9.96
TOTAL MEANS         5.25        8.27        6.76
                             GROUP
           SOURCE          SS          DF         MS
           GROUP          68.10         1        68.10
           SUBJECT       160.87        14        11.49
           ERROR          45.24        14         3.23
           TOTAL         274.21        29
           GROUP F        21.08        DF =  1,14
           SUBJECT F       3.56        DF = 14,14

           LE>VS EE  SIGNIFICANT AT .05 LEVEL

                           BOYS                                GIRLS
 SOURCE          SS        DF         MS           SS          DF          MS
 GROUP          18.50       1        18.50        51.00         1        51.00
 SUBJECT        65.82       5        17.16        67.81         8         8.48
 ERROR          22.80       5         4.56        21.03         8         2.63
 TOTAL         127.13      11                    139.84        17
 GROUP F         4.06      DF =  1, 5             19.40        DF =  1, 8
 SUBJECT F       3.76      DF =  5, 5              3.22        DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL.  LE>VS EE SIGNIFICANT AT .05 LEVEL
*************************************************************************
```

```
                              TABLE 18

      FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                     UNDER GROUPS OF SCORES OF:

***********************************************************************
                         (NATIONAL PERCENTILE)
16.  SILENT READING VOCABULARY (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
-----------------------------------------------------------------------

                         EE          LE         XBAR   SEX

                 1      45.00       99.00       72.00   M
                 2      35.00       87.00       61.00   F
                 3      42.00       94.00       68.00   F
                 4      56.00       38.00       47.00   M
                 5      28.00       87.00       57.50   F
                 6      13.00       99.00       56.00   F
                 7       6.00        5.00        5.50   M

          MEANS         32.14       72.71

                 8      35.00       42.00       38.50   M
                 9      68.00       99.00       83.50   M
                10      53.00       88.00       70.50   F
                11      78.00       96.00       87.00   F
                12      64.00       91.00       77.50   M
                13      45.00       91.00       68.00   F
                14      53.00       49.00       51.00   F
                15      72.00       99.00       85.50   F

          MEANS         58.50       81.88
    TOTAL MEANS         46.20       77.60       61.90
                                 GROUP
                SOURCE          SS         DF          MS
                GROUP         7394.70       1       7394.70
                SUBJECT      12543.20      14        895.94
                ERROR         5442.80      14        388.77
                TOTAL        25380.70      29
                GROUP F         19.02      DF =  1,14
                SUBJECT F        2.30      DF = 14,14

                LE>VS EE  SIGNIFICANT AT .05 LEVEL

                         BOYS                              GIRLS
SOURCE          SS        DF        MS          SS        DF        MS
GROUP         833.33       1      833.33     7646.72       1     7646.72
SUBJECT      8776.00       5     1755.20     2519.00       8      314.88
ERROR        1656.67       5      331.33     2700.78       8      337.60
TOTAL       11266.00      11                12866.50      17
GROUP F         2.52     DF =  1, 5           22.65      DF =  1, 8
SUBJECT F       5.30     DF =  5, 5            0.93      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
***********************************************************************
```

```
                              TABLE 19

       FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTEC
                        UNDER GROUPS OF SCORES OF:

**********************************************************************
                          (GRADE EQUIVALENTS)
17.  SILENT READING COMPREHENSION (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
----------------------------------------------------------------------

                          EE         LE         XBAR   SEX

                  1      4.90      11.90        8.40    M
                  2      3.60       6.60        5.10    F
                  3      4.90      10.20        7.55    F
                  4      4.90       4.60        4.75    M
                  5      3.30       8.30        5.80    F
                  6      2.90       8.90        5.90    F
                  7      3.50       2.90        3.20    M

          MEANS          4.00       7.63

                  8      7.30       6.50        6.90    M
                  9     10.40      11.60       11.00    M
                 10      8.50      12.90       10.70    F
                 11      6.20       8.90        7.55    F
                 12      4.70      12.90        8.80    M
                 13      6.80       9.90        8.35    F
                 14      5.90       6.20        6.05    F
                 15      7.30      12.90       10.10    F

          MEANS          7.14      10.23
    TOTAL MEANS          5.67       9.01        7.34
                                 GROUP
                SOURCE         SS         DF         MS
                GROUP         83.67        1        83.67
                SUBJECT      143.67       14        10.26
                ERROR         58.62       14         4.19
                TOTAL        285.95       29
                GROUP F       19.90      DF =  1,14
                SUBJECT F      2.45      DF = 14,14

                LE>VS EE  SIGNIFICANT AT .05 LEVEL

                           BOYS                             GIRLS
SOURCE           SS         DF          MS          SS        DF         MS
GROUP          18.01         1        18.01       69.62        1       69.62
SUBJECT        81.06         5        16.21       62.04        8        7.76
ERROR          41.30         5         8.26       13.28        8        1.66
TOTAL         140.44        11                   144.94       17
GROUP F         2.18      DF =  1, 5              41.94     DF =  1, 8
SUBJECT F       1.96      DF =  5, 5               4.67     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

TABLE 20

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
=====================================================================
                       (NATIONAL PERCENTILE)
19.  SILENT READING COMPREHENSION (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
---------------------------------------------------------------------

                      EE          LE          XBAR    SEX

              1      66.00       99.00        82.50    M
              2      40.00       66.00        53.00    F
              3      66.00       99.00        82.50    F
              4      66.00       60.00        63.00    M
              5      30.00       95.00        62.50    F
              6      18.00       97.00        57.50    F
              7      24.00       22.00        23.00    M

       MEANS         44.29       79.71

              8      54.00       42.00        48.00    M
              9      85.00       92.00        88.50    M
             10      66.00       96.00        81.00    F
             11      83.00       62.00        62.50    F
             12      63.00       99.00        81.00    M
             13      34.00       82.00        58.00    F
             14      34.00       37.00        35.50    F
             15      54.00       98.00        76.00    F

       MEANS         59.13       78.50
 TOTAL MEANS         52.20       79.07        65.63
                               GROUP
             SOURCE          SS           DF         MS
             GROUP         5413.63         1      5413.63
             SUBJECT      10281.47        14       734.39
             ERROR         5395.87        14       378.99
             TOTAL        21090.97        29
             GROUP F         14.28       DF =  1,14
             SUBJECT F        1.94       DF = 14,14

             LE>VS EE  SIGNIFICANT AT .05 LEVEL

                           BOYS                              GIRLS
 SOURCE          SS         DF         MS           SS         DF          MS
 GROUP         261.33        1       261.33      6689.39        1       6689.39
 SUBJECT      6337.67        5      1267.53      3910.00        8        488.75
 ERROR        1047.67        5       209.53      2721.11        8        340.14
 TOTAL        7646.67       11                  13320.50       17
 GROUP F         1.25      DF =  1, 5              19.67      DF =  1, 8
 SUBJECT F       6.05      DF =  5, 5               1.44      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
=====================================================================
```

TABLE 21

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
***********************************************************************
                         (GRADE EQUIVALENTS)
 19.  TOTAL SILENT READING (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
-----------------------------------------------------------------------

                         EE          LE          XBAR   SEX

                 1      4.40       11.50         7.95   M
                 2      3.60        6.30         4.95   F
                 3      4.30        8.10         6.20   F
                 4      4.60        4.10         4.35   M
                 5      3.20        6.90         5.05   F
                 6      2.90        9.70         6.30   F
                 7      3.00        2.20         2.60   M

         MEANS          3.71        6.97

                 8      6.70        6.60         6.65   M
                 9      9.10       12.20        10.65   M
                10      7.70       11.20         9.45   F
                11      5.70        9.30         7.50   F
                12      4.70       12.20         8.45   M
                13      7.30        9.90         8.60   F
                14      6.70        6.60         6.65   F
                15      8.00       12.90        10.45   F

         MEANS          6.99       10.11
   TOTAL MEANS          5.46        8.65         7.05
                                 GROUP
                  SOURCE         SS          DF          MS
                  GROUP         76.16         1        76.16
                  SUBJECT      145.52        14        10.39
                  ERROR         51.25        14         3.66
                  TOTAL        272.93        29
                  GROUP F       20.81        DF =  1,14
                  SUBJECT F      2.84        DF = 14,14

                  LE>VS EE  SIGNIFICANT AT .05 LEVEL

                             BOYS                                GIRLS
SOURCE            SS        DF         MS           SS          DF          MS
GROUP            22.14       1        22.14        55.13         1         55.13
SUBJECT          85.06       5        17.01        58.92         8          7.36
ERROR            36.44       5         7.29        13.70         8          1.71
TOTAL           143.64      11                    127.74        17
GROUP F           3.04      DF =  1, 5             32.19        DF =  1, 8
SUBJECT F         2.33      DF =  5, 5              4.30        DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
***********************************************************************
```

```
                                  TABLE 22

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                         UNDER GROUPS OF SCORES OF:

=============================================================================
                         (NATIONAL PERCENTILE)
  2P.  TOTAL SILENT READING (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
-----------------------------------------------------------------------------

                            EE          LE          XBAR    SEX

                  1       59.00       99.00       79.00     M
                  2       37.00       88.00       62.50     F
                  3       57.00       98.00       77.50     F
                  4       63.00       52.00       57.50     M
                  5       28.00       93.00       60.50     F
                  6       12.00       99.00       55.50     F
                  7       10.00        9.00        9.50     M

          MEANS           38.00       76.86

                  8       44.00       42.00       43.00     M
                  9,      78.00       97.00       87.50     M
                 10       60.00       94.00       77.00     F
                 11       82.00       90.00       86.00     F
                 12       65.00       97.00       81.00     M
                 13       39.00       88.00       63.50     F
                 14       44.00       50.00       47.00     F
                 15       64.00       99.00       81.50     F

          MEANS           59.50       82.13
    TOTAL MEANS           49.47       79.67       64.57
                                 GROUP
                 SOURCE         SS          DF          MS
                 GROUP        6840.30        1        6840.30
                 SUBJECT     12064.87       14         861.78
                 ERROR        5194.20       14         371.01
                 TOTAL       24099.37       29
                 GROUP F        18.44       DF = 1,14
                 SUBJECT F       2.32       DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                             BOYS                               GIRLS
  SOURCE          SS          DF         MS           SS          DF          MS
  GROUP          494.08       1        494.08      7854.22        1      7854.22
  SUBJECT       8805.42       5       1761.08      2762.78        8       345.35
  ERROR         1061.42       5        212.28      2624.78        8       328.10
  TOTAL        10360.92      11                   13241.78       17
  GROUP F          2.33      DF =  1, 5              23.94      DF =  1, 8
  SUBJECT F        8.30      DF =  5, 5               1.05      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
=============================================================================
```

TABLE 23

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
========================================================================
                       (GRADE EQUIVALENTS)
21.  GENERAL LANGUAGE ACHIEVEMENT (CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
------------------------------------------------------------------------

                     EE          LE        XBAR   SEX

            1       7.30       16.50      11.90    M
            2       6.90       11.40       9.15    F
            3       9.30       15.00      12.15    F
            4       9.60        7.70       8.65    M
            5       5.70       10.20       7.95    F
            6       5.70       21.60      13.65    F
            7       5.70        5.10       5.40    M

      MEANS         7.17       12.50

            8      12.00       12.30      12.15    M
            9      16.70       19.10      17.90    M
           10      16.70       22.90      19.80    F
           11      11.10       18.10      14.60    F
           12       8.80       21.20      15.00    M
           13      14.70       20.60      17.65    F
           14      13.10       15.00      14.05    F
           15      14.50       25.80      20.15    F

      MEANS        13.45       19.38
TOTAL MEANS        10.52       16.17      13.34
                           GROUP
           SOURCE        SS          DF          MS
           GROUP       239.14         1       239.14
           SUBJECT     537.95        14        38.42
           ERROR       174.65        14        12.47
           TOTAL       951.73        29
           GROUP F      19.17      DF =  1,14
           SUBJECT F     3.08      DF = 14,14

           LE>VS EE  SIGNIFICANT AT .05 LEVEL

                         BOYS                                GIRLS
SOURCE          SS       DF          MS         SS          DF          MS
GROUP         39.60       1        39.60      219.80         1       219.80
SUBJECT      196.92       5        39.38      295.43         8        36.93
ERROR         84.51       5        16.90       69.87         8         8.73
TOTAL        321.03      11                   585.10        17
GROUP F        2.34     DF =  1, 5             25.17       DF =  1, 8
SUBJECT F      2.33     DF =  5, 5              4.23       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
========================================================================
```

TABLE 24

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
*****************************************************************************
                          (NATIONAL PERCENTILE)
22.  GENERAL LANGUAGE ACHIEVEMENT(CTMM SHORT FM TEST OF ACADEMIC APTITUDE).
-----------------------------------------------------------------------------

                           EE          LE          XBAR   SEX

                  1       79.00      168.00      123.50    M
                  2       66.00      160.00      113.00    F
                  3      127.00      191.00      159.00    F
                  4      133.00       91.00      112.00    M
                  5       39.00      122.00       80.50    F
                  6       32.00      198.00      115.00    F
                  7       28.00       29.00       28.50    M

          MEANS           72.00      137.00

                  8       67.00       72.00       69.50    M
                  9      136.00      143.00      139.50    M
                 10      134.00      188.00      161.00    F
                 11      160.00      174.00      167.00    F
                 12      116.00      171.00      143.50    M
                 13       81.00      179.00      130.00    F
                 14       84.00      122.00      103.00    F
                 15      102.00      198.00      150.00    F

          MEANS          110.00      155.88
    TOTAL MEANS           92.27      147.07      119.67
                                  GROUP
                 SOURCE          SS          DF          MS
                 GROUP       22522.80         1    22522.80
                 SUBJECT     40527.67        14     2894.83
                 ERROR       19246.20        14     1374.73
                 TOTAL       82296.67        29
                 GROUP F        16.38      DF =  1,14
                 SUBJECT F       2.11      DF = 14,14
                 LE>VS. EE SIGNIFICANT AT .05 LEVEL

                           BOYS                                  GIRLS
SOURCE          SS          DF          MS           SS          DF          MS
GROUP        1102.08         1      1102.08      27769.39         1    27769.39
SUBJECT     20291.75         5      4058.35      14512.44         8     1814.06
ERROR        5290.42         5      1058.08       7607.11         8      950.89
TOTAL       26684.25        11                   49888.95        17
GROUP F         1.04      DF =  1, 5                29.20      DF =  1, 8
SUBJECT F       3.84      DF =  5, 5                 1.91      DF =  8, 8

LE>VS. EE NOT SIGNIFICANT AT .05 LEVEL LE>VS. EE SIGNIFICANT AT .05 LEVEL
*****************************************************************************
```

```
                                  TABLE 25

         FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                         UNDER GROUPS OF SCORES OF:

=====================================================================
                                 (STANINE)
 23.  GILMORE ORAL READING TEST (TOTAL ACCURACY OF ORAL READING SCORES).
---------------------------------------------------------------------

                         EE          LE          XBAR   SEX

                 1      7.00        8.00         7.50    M
                 2      4.00        6.00         5.00    F
                 3      5.00        6.00         5.50    F
                 4      9.80        4.00         6.90    M
                 5      3.00        7.00         5.00    F
                 6      4.00        9.00         6.50    F
                 7      2.00        3.00         2.50    M

         MEANS          4.97        6.14

                 8      2.00        5.00         3.50    M
                 9      7.00        6.00         6.50    M
                10      7.00        8.00         7.50    F
                11      8.00        5.00         6.50    F
                12      7.00        6.00         6.50    M
                13      4.00        7.00         5.50    F
                14      6.00        5.00         5.50    F
                15      5.00        9.00         7.00    F

         MEANS          5.75        6.38
   TOTAL MEANS          5.39        6.27         5.83
                                GROUP
                SOURCE           SS          DF            MS
                GROUP           5.81          1           5.81
                SUBJECT        56.22         14           4.02
                ERROR          58.51         14           4.18
                TOTAL         120.54         29
                GROUP F         1.39       DF =  1,14
                SUBJECT F       0.96       DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                  GIRLS
 SOURCE          SS         DF           MS           SS         DF          MS
 GROUP          0.65         1          0.65        14.22         1        14.22
 SUBJECT       41.87         5          8.37        13.00         8         1.63
 ERROR         22.67         5          4.53        26.78         8         3.35
 TOTAL         65.19        11                      54.00        17
 GROUP F        0.14       DF =  1, 5                4.25       DF =  1, 8
 SUBJECT F      1.85       DF =  5, 5                0.49       DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=====================================================================
                              TABLE 26

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF:

=====================================================================
                        (GRADE EQUIVALENTS)
 2A.  GILMORE ORAL READING TEST (TOTAL ACCURACY OF ORAL READING SCORES).
---------------------------------------------------------------------

                          EE          LE          XBAR    SEX

                  1       6.30        7.00        6.65     M
                  2       3.90        5.80        4.85     F
                  3       0.50        5.80        3.15     F
                  4       9.80        3.50        6.65     M
                  5       3.60        6.10        4.85     F
                  6       3.90        9.80        6.85     F
                  7       3.40        3.90        3.65     M

           MEANS          4.49        6.04

                  8       4.40        7.00        5.70     M
                  9       9.80        9.70        9.75     M
                 10       9.80        9.80        9.80     F
                 11       9.80        7.00        8.40     F
                 12       9.40        9.00        9.20     M
                 13       6.40        9.80        8.10     F
                 14       9.50        8.60        9.05     F
                 15       8.40        9.80        9.10     F

           MEANS          8.44        8.84
     TOTAL MEANS          6.59        7.53        7.06
                                  GROUP
                 SOURCE         SS          DF          MS
                 GROUP          6.63         1          6.63
                 SUBJECT      138.22        14          9.87
                 ERROR         64.88        14          4.63
                 TOTAL        209.73        29
                 GROUP F        1.43       DF =  1,14
                 SUBJECT F      2.13       DF = 14,14

                 LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                               BOYS                              GIRLS
 SOURCE          SS          DF          MS          SS          DF          MS
 GROUP           0.56         1          0.56       15.49         1        15.49
 SUBJECT        50.91         5         10.18       87.13         8        10.89
 ERROR          23.48         5          4.70       31.97         8         4.00
.TOTAL          74.95        11                    134.60        17
 GROUP F         0.12        DF =  1, 5              3.88        DF =  1, 8
 SUBJECT F       2.17        DF =  5, 5              2.73        DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=====================================================================
                                   TABLE 27

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                          UNDER GROUPS OF SCORES OF:

==================================================================================
                             (PERFORMANCE RATING)
25,  GILMORE ORAL READING TEST (TOTAL ACCURACY OF ORAL READING SCORES),
----------------------------------------------------------------------------------

                                 EE          LE          XBAR    SEX

                       1        3.00        3.00         3.00     M
                       2        2.00        3.00         2.50     F
                       3        2.00        3.00         2.50     F
                       4        4.00        3.00         3.50     M
                       5        1.00        3.00         2.00     F
                       6        2.00        4.00         3.00     F
                       7        1.00        1.00         1.00     M

                 MEANS          2.14        2.86

                       8        1.00        2.00         1.50     M
                       9        3.00        2.00         2.50     M
                      10        3.00        3.00         3.00     F
                      11        3.00        2.00         2.50     F
                      12        3.00        2.00         2.50     M
                      13        2.00        3.00         2.50     F
                      14        2.00        2.00         2.00     F
                      15        2.00        4.00         3.00     F

                 MEANS          2.38        2.50
           TOTAL MEANS          2.27        2.67         2.47
                                       GROUP
                      SOURCE          SS         DF           MS
                      GROUP          1.20         1          1.20
                      SUBJECT       11.47        14          0.82
                      ERROR          8.80        14          0.63
                      TOTAL         21.47        29
                      GROUP F        1.91      DF =  1,14
                      SUBJECT F      1.30      DF = 14,14

                      LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                             BOYS                                  GIRLS
SOURCE             SS        DF          MS          SS          DF            MS
GROUP             0.33        1         0.33        3.56          1           3.56
SUBJECT           8.67        5         1.73        2.44          8           0.31
ERROR             1.67        5         0.33        4.44          8           0.56
TOTAL            10.67       11                    10.44         17
GROUP F           1.00     DF =  1, 5               6.40      DF =  1, 8
SUBJECT F         5.20     DF =  5, 5               0.55      DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
==================================================================================
                              TABLE 28

   FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                     UNDER GROUPS OF SCORES OF:

=======================================================================
                              (STANINE)
26.  GILMORE ORAL READING TEST:  (COMPREHENSION SCORES OF MATERIAL READ).
-----------------------------------------------------------------------

                      EE          LE          XBAR   SEX

                1     3.00        9.00        6.00    M
                2     6.00        7.00        6.50    F
                3     6.00        6.00        6.00    F
                4     9.00        4.00        6.90    M
                5     7.00        7.00        7.00    F
                6     8.00        9.00        8.50    F
                7     4.00        4.00        4.00    M

         MEANS        6.26        6.57

                8     4.00        7.00        5.50    M
                9     9.00        9.00        9.00    M
               10     9.00        9.00        9.00    F
               11     8.00        6.00        7.00    F
               12     9.00        9.00        9.00    M
               13     6.00        9.00        7.50    F
               14     2.00        6.00        4.00    F
               15     5.00        9.00        7.00    F

         MEANS        6.50        8.00
   TOTAL MEANS        6.39        7.33        6.86
                                GROUP
                SOURCE          SS          DF          MS
                GROUP           6.72         1          6.72
                SUBJECT        73.43        14          5.25
                ERROR          56.10        14          4.01
                TOTAL         136.25        29
                GROUP F         1.68       DF =  1,14
                SUBJECT F       1.31       DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                         BOYS                                GIRLS
SOURCE          SS         DF         MS          SS          DF          MS
GROUP          0.85        1         0.85        6.72         1          6.72
SUBJECT       39.67        5         7.93       33.44         8          4.18
ERROR         38.47        5         7.69       16.78         8          2.10
TOTAL         78.99       11                    56.94        17
GROUP F        0.11      DF =  1, 5              3.21      DF =  1, 8
SUBJECT F      1.03      DF =  5, 5              1.99      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=======================================================================
```

TABLE 29

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
========================================================================
                         (GRADE EQUIVALENTS)
27.  GILMORE ORAL READING TEST:  (COMPREHENSION SCORES OF MATERIAL READ).
------------------------------------------------------------------------

                        EE          LE          XBAR   SEX

              1        2.30        9.80         6.05    M
              2        5.40        7.50         6.45    F
              3        5.80        5.40         5.60    F
              4        9.80        3.80         6.80    M
              5        7.10        7.10         7.10    F
              6        7.50        9.80         8.65    F
              7        4.10        3.40         3.75    M

        MEANS          6.00        6.69

              8        5.80        9.80         7.80    M
              9        9.80        9.80         9.80    M
             10        9.80        9.80         9.80    F
             11        9.80        5.10         7.45    F
             12        9.80        7.80         8.80    M
             13        9.50        9.80         9.65    F
             14        4.20        9.70         6.95    F
             15        8.70        9.80         9.25    F

        MEANS          8,43        8,95
  TOTAL MEANS          7.29        7.89         7.59
                                GROUP
             SOURCE          SS          DF          MS
             GROUP          2.70          1         2.70
             SUBJECT       86.14         14         6.15
             ERROR         85,42         14         6.10
             TOTAL        174,26         29
             GROUP F        0.44        DF =  1,14
             SUBJECT F      1.01        DF = 14,14

             LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                               GIRLS
 SOURCE          SS        DF         MS          SS         DF          MS
 GROUP          0.65        1        0.65        2.14         1         2.14
 SUBJECT       46.12        5        9.22       36.38         8         4.55
 ERROR         55.72        5       11.14       29.61         8         3.70
 TOTAL        102.49       11                   68.13        17
 GROUP F        0.06       DF =  1, 5            0.58       DF =  1, 8
 SUBJECT F      0.83       DF =  5, 5            1.23       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
========================================================================
```

TABLE 30

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
==========================================================================
                           (PERFORMANCE RATING)
28.  GILMORE ORAL READING TEST:  (COMPREHENSION SCORES OF MATERIAL READ).
--------------------------------------------------------------------------

                          EE         LE         XBAR   SEX

                 1        1.00       4.00        2.50   M
                 2        2.00       3.00        2.50   F
                 3        2.00       3.00        2.50   F
                 4        4.00       3.00        3.50   M
                 5        3.00       3.00        3.00   F
                 6        3.00       4.00        3.50   F
                 7        2.00       2.00        2.00   M

          MEANS           2.43       3.14

                 8        1.00       3.00        2.00   M
                 9        4.00       4.00        4.00   M
                10        4.00       4.00        4.00   F
                11        3.00       2.00        2.50   F
                12        4.00       4.00        4.00   M
                13        2.00       4.00        3.00   F
                14        1.00       2.00        1.50   F
                15        2.00       4.00        3.00   F

          MEANS           2.63       3.38
    TOTAL MEANS           2.53       3.27        2.90
                                  GROUP
                 SOURCE        SS        DF          MS
                 GROUP         4.03       1          4.03
                 SUBJECT      17.20      14          1.23
                 ERROR         9.47      14          0.68
                 TOTAL        30.70      29
                 GROUP F       5.96     DF =  1,14
                 SUBJECT F     1.82     DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                              BOYS                                GIRLS
 SOURCE          SS         DF          MS           SS           DF          MS
 GROUP           1.33        1          1.33         2.72          1          2.72
 SUBJECT         9.00        5          1.80         8.00          8          1.00
 ERROR           5.67        5          1.13         3.78          8          0.47
 TOTAL          16.00       11                      14.50         17
 GROUP F         1.18      DF =  1, 5                5.76       DF =  1, 8
 SUBJECT F       1.59      DF =  5, 5                2.12       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
==========================================================================
```

TABLE 31

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
*********************************************************************************
                                  (STANINE)
     29.  GILMORE ORAL READING TEST: (RATE OF READING SCORES).
---------------------------------------------------------------------------------

                            EE          LE           XBAR   SEX

                    1       1.20        1.90          1.55    M
                    2       0.80        2.60          1.70    F
                    3       1.30        2.80          2.05    F
                    4       1.00        1.90          1.45    M
                    5       1.50        2.40          1.95    F
                    6       0.70        2.50          1.60    F
                    7       2.30        2.00          2.15    M

          MEANS             1.26        2.30

                    8       1.10        1.80          1.45    M
                    9       1.90        2.20          2.05    M
                   10       2.40        2.50          2.45    F
                   11       2.30        2.60          2.45    F
                   12       1.20        2.00          1.60    M
                   13       1.30        2.10          1.70    F
                   14       1.45        2.20          1.83    F
                   15       1.00        2.20          1.60    F

          MEANS             1.58        2.20
    TOTAL MEANS             1.43        2.25          1.84
                                     GROUP
                 SOURCE           SS          DF            MS
                 GROUP            5.00         1           5.00
                 SUBJECT          3.08        14           0.22
                 ERROR            2.44        14           0.17
                 TOTAL           10.53        29
                 GROUP F         28.65      DF =  1,14
                 SUBJECT F        1.26      DF = 14,14

                 LE>VS EE  SIGNIFICANT AT .05 LEVEL

                            BOYS                                   GIRLS
  SOURCE         SS        DF         MS          SS          DF            MS
  GROUP          0.80       1         0.80        4.65         1           4.65
  SUBJECT        0.96       5         0.19        1.78         8           0.22
  ERROR          0.50       5         0.10        1.49         8           0.19
  TOTAL          2.27      11                     7.92        17
  GROUP F        7.94      DF =  1, 5            24.97       DF =  1, 8
  SUBJECT F      1.91      DF =  5, 5             1.19       DF =  8, 8

LE>VS EE SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
*********************************************************************************
```

TABLE 32

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
================================================================================
                                 (STANINE)
                      30.  TOTAL ORAL READING SKILLS.
--------------------------------------------------------------------------------

                       EE          LE          XBAR    SEX

              1       11.20       18.90       15.05     M
              2       10.80       15.60       13.20     F
              3       12.30       14.80       13.55     F
              4       20.60        9.90       15.25     M
              5       11.50       16.40       13.95     F
              6       12.70       20.50       16.60     F
              7        8.30        9.00        8.65     M

      MEANS           12.49       15.01

              8        7.10       13.80       10.45     M
              9       17.90       17.20       17.55     M
             10       18.40       19.50       18.95     F
             11       18.30       13.60       15.95     F
             12       17.20       17.00       17.10     M
             13       11.30       18.10       14.70     F
             14        9.45       13.20       11.33     F
             15       11.00       20.20       15.60     F

      MEANS           13.83       16.59
TOTAL MEANS           13.20       15.85       14.53
                                GROUP
              SOURCE          SS        DF          MS
              GROUP          52.40       1         52.40
              SUBJECT       216.17      14         15.44
              ERROR         198.63      14         14.19
              TOTAL         467.20      29
              GROUP F         3.69     DF =  1,14
              SUBJECT F       1.09     DF = 14,14

              LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                             BOYS                               GIRLS
SOURCE          SS          DF          MS          SS          DF          MS
GROUP          1.02          1         1.02        72.60         1        72.60
SUBJECT      132.20          5        26.44        78.62         8         9.83
ERROR        108.82          5        21.76        68.59         8         8.57
TOTAL        242.05         11                    219.82        17
GROUP F        0.05        DF =  1, 5               8.47      DF =  1, 8
SUBJECT F      1.21        DF =  5, 5               1.15      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
================================================================================
                              TABLE 33

      FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

**********************************************************************
                        (GRADE EQUIVALENTS)
                 31.  TOTAL ORAL READING SKILLS.
----------------------------------------------------------------------

                          EE          LE          XBAR    SEX

                  1       8.60       17.20        12.90    M
                  2       9.30       13.30        11.30    F
                  3       6.30       11.20         8.75    F
                  4      19.60        7.30        13.45    M
                  5      10.70       13.20        11.95    F
                  6      11.40       19.60        15.50    F
                  7       7.50        7.30         7.40    M

             MEANS       10.49       12.73

                  8      10.20       16.80        13.50    M
                  9      19.60       19.50        19.55    M
                 10      19.60       19.60        19.60    F
                 11      19.60       12.10        15.85    F
                 12      19.20       16.80        18.00    M
                 13      15.90       19.60        17.75    F
                 14      13.70       18.30        16.00    F
                 15      17.10       19.60        18.35    F

             MEANS       16.86       17.79
       TOTAL MEANS       13.89       15.43        14.66
                                  GROUP
                 SOURCE         SS          DF          MS
                 GROUP         17.79         1        17.79
                 SUBJECT      397.46        14        28.39
                 ERROR        224.95        14        16.07
                 TOTAL        640.19        29
                 GROUP F        1.11       DF =  1,14
                 SUBJECT F      1.77       DF = 14,14

                 LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                 GIRLS
SOURCE           SS        DF         MS         SS         DF          MS
GROUP           0.00        1        0.00       29.13        1        29.13
SUBJECT       184.04        5       36.81      207.94        8        25.99
ERROR         137.31        5       27.46       76.29        8         9.54
TOTAL         321.35       11                  313.37       17
GROUP F         0.00      DF =  1, 5             3.06      DF =  1, 8
SUBJECT F       1.34      DF =  5, 5             2.73      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

```
                              TABLE 34

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

**********************************************************************
                         (PERFORMANCE RATING)
                 32.  TOTAL ORAL READING SKILLS.
----------------------------------------------------------------------

                         EE          LE          XBAR    SEX

               1         6.00       10.00        8.00     M
               2         6.00       10.00        8.00     F
               3         6.00       10.00        8.00     F
               4        10.00        9.00        9.50     M
               5         6.00       10.00        8.00     F
               6         7.00       12.00        9.50     F
               7         6.00        6.00        6.00     M

         MEANS           6.71        9.57

               8         5.00        7.00        6.00     M
               9         9.00        9.00        9.00     M
              10         9.00       10.00        9.50     F
              11         9.00        8.00        8.50     F
              12        11.00        8.00        9.50     M
              13         5.00        9.00        7.00     F
              14         5.00        6.00        5.50     F
              15         5.00       10.00        7.50     F

         MEANS           7.25        8.38
   TOTAL MEANS           7.00        8.93        7.97
                                 GROUP
               SOURCE        SS          DF          MS
               GROUP        28.03         1         28.03
               SUBJECT      51.47        14          3.68
               ERROR        45.47        14          3.25
               TOTAL       124.97        29
               GROUP F       8.63        DF =  1,14
               SUBJECT F     1.13        DF = 14,14

               LE>VS EE  SIGNIFICANT AT .05 LEVEL

                           BOYS                             GIRLS
 SOURCE            SS       DF         MS          SS        DF          MS
 GROUP            0.33       1        0.33       40.50        1        40.50
 SUBJECT         27.00       5        5.40       24.44        8         3.06
 ERROR           14.67       5        2.93       18.00        8         2.25
 TOTAL           42.00      11                   82.94       17
 GROUP F          0.11     DF =  1, 5            18.00     DF =  1, 8
 SUBJECT F        1.84     DF =  5, 5             1.36     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

TABLE 35

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES ON:

```
***************************************************************************
                 (GRADE EQUIVALENTS-RATE SCORE WPM)
      33.  GILMORE ORAL READING TEST:  (RATE OF READING SCORES).
---------------------------------------------------------------------------

                           EE          LE          XBAR  SEX

                 1       271.00      470.00      370.50   M
                 2       192.00      271.00      231.50   F
                 3       168.00      271.00      219.50   F
                 4       676.00      192.00      434.00   M
                 5        95.00      271.00      183.00   F
                 6       168.00      631.00      399.50   F
                 7       119.00       50.00       84.50   M

          MEANS          241.29      308.00

                 8       123.00      420.00      271.50   M
                 9       689.00      762.00      725.50   M
                10       689.00      942.00      815.50   F
                11       942.00      420.00      681.00   F
                12       508.00      762.00      635.00   M
                13       176.00      942.00      559.00   F
                14       420.00      581.00      500.50   F
                15       220.00      839.00      529.50   F

          MEANS          470.88      708.50
    TOTAL MEANS          363.73      521.60      442.67
                                   GROUP
                SOURCE          SS          DF          MS
                GROUP       186914.19        1    186914.19
                SUBJECT    1327523.69       14     94823.12
                ERROR       828684.81       14     59191.77
                TOTAL      2343122.69       29
                GROUP F          3.16      DF =  1,14
                SUBJECT F        1.60      DF = 14,14
                LE>VS, EE NOT SIGNIFICANT AT .05 LEVEL

                              BOYS                                 GIRLS
SOURCE            SS          DF          MS           SS           DF        MS
GROUP          6075.00         1      6075.00      244533.56          1   244533.56
SUBJECT      553627.66         5    110725.53      763771.01          8    95471.38
ERROR        212260.99         5     42452.20      552729.43          8    69091.18
TOTAL        771963.66        11                  1561034.00         17
GROUP F           0.14      DF =  1, 5                  3.54      DF =  1, 8
SUBJECT F         2.61      DF =  5, 5                  1.38      DF =  8, 8

LE>VS, EE NOT SIGNIFICANT AT .05 LEVEL LE>VS, EE NOT SIGNIFICANT AT .05 LEVEL
*****************************************************************************
```

TABLE 36

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
=======================================================================
                        (PERFORMANCE RATING)
   36.  GILMORE ORAL READING TEST: (RATE OF READING SCORES).
-----------------------------------------------------------------------

                      EE            LE            XBAR    SEX

              1      2.00          3.00          2.50     M
              2      2.00          4.00          3.00     F
              3      2.00          4.00          3.00     F
              4      2.00          3.00          2.50     M
              5      2.00          4.00          3.00     F
              6      2.00          4.00          3.00     F
              7      3.00          3.00          3.00     M

      MEANS          2.14          3.57

              8      3.00          2.00          2.50     M
              9      2.00          3.00          2.50     M
             10      2.00          3.00          2.50     F
             11      3.00          4.00          3.50     F
             12      4.00          2.00          3.00     M
             13      1.00          2.00          1.50     F
             14      2.00          2.00          2.00     F
             15      1.00          2.00          1.50     F

      MEANS          2.25          2.50
TOTAL MEANS          2.20          3.00          2.60
                              GROUP
             SOURCE          SS         DF           MS
             GROUP          4.80         1          4.80
             SUBJECT        9.20        14          0.66
             ERROR          9.20        14          0.66
             TOTAL         23.20        29
             GROUP F        7.30       DF =  1,14
             SUBJECT F      1.00       DF = 14,14

             LE>VS EE  SIGNIFICANT AT .05 LEVEL

                         BOYS                                GIRLS
SOURCE           SS        DF          MS          SS        DF         MS
GROUP           0.00        1         0.00        8.00        1        8.00
SUBJECT         0.67        5         0.13        8.44        8        1.06
ERROR           4.00        5         0.80        2.00        8        0.25
TOTAL           4.67       11                    18.44       17
GROUP F         0.00      DF =  1, 5            32.00      DF =  1, 8
SUBJECT F       0.17      DF =  5, 5             4.22      DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
=======================================================================
```

TABLE 37

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
=========================================================================
        35.  ARTICULATION TESTING (SUBSTITUTION OF PHONEMES).
-------------------------------------------------------------------------

                          EE          LE          XBAR    SEX

                   1      0.00        0.00        0.00    M
                   2     11.00        0.00        5.50    F
                   3      0.00        0.00        0.00    F
                   4      0.00        0.00        0.00    M
                   5      0.00        0.00        0.00    F
                   6      0.00        0.00        0.00    F
                   7      0.00        0.00        0.00    M

           MEANS          1.57        0.00

                   8      0.00        0.00        0.00    M
                   9      3.00        0.00        1.50    M
                  10      0.00       11.00        5.50    F
                  11     11.00        0.00        5.50    F
                  12      7.00        0.00        3.50    M
                  13      0.00        0.00        0.00    F
                  14      0.00        0.00        0.00    F
                  15      0.00        0.00        0.00    F

           MEANS          2.63        1.38
     TOTAL MEANS          2.13        0.73        1.43
                                  GROUP
                  SOURCE          SS         DF          MS
                  GROUP          14.70        1         14.70
                  SUBJECT       148.87       14         10.63
                  ERROR         195.80       14         13.99
                  TOTAL         359.37       29
                  GROUP F         1.05      DF =  1,14
                  SUBJECT F       0.76      DF = 14,14

                  LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                 GIRLS
SOURCE           SS        DF          MS          SS          DF          MS
GROUP           8.33        1         8.33        6.72         1         6.72
SUBJECT        20.67        5         4.13      121.00         8        15.13
ERROR          20.67        5         4.13      174.78         8        21.85
TOTAL          49.67       11                   302.50        17
GROUP F         2.02       DF =  1, 5             0.31       DF =  1, 8
SUBJECT F       1.00       DF =  5, 5             0.69       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
*************************************************************************
```

```
                              TABLE 38

   FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

**********************************************************************
        36.  ARTICULATION TESTING (DISTORTION OF SOUNDS).
----------------------------------------------------------------------

                         EE           LE          XBAR   SEX

                1        0.00         0.00         0.00   M
                2        4.00         0.00         2.00   F
                3        0.00        11.00         5.50   F
                4        0.00         0.00         0.00   M
                5        0.00         0.00         0.00   F
                6        0.00         0.00         0.00   F
                7        0.00         0.00         0.00   M

          MEANS          0.57         1.57

                8        0.00         0.00         0.00   M
                9       11.00         0.00         5.50   M
               10        0.00         0.00         0.00   F
               11        4.00         0.00         2.00   F
               12        0.00         0.00         0.00   M
               13        0.00         0.00         0.00   F
               14        0.00         0.00         0.00   F
               15        0.00         0.00         0.00   F

          MEANS          1.88         0.00
    TOTAL MEANS          1.27         0.73         1.00
                                  GROUP
                SOURCE          SS      [illegible]        MS
                GROUP          2.13         1            2.13
                SUBJECT      107.00        14            7.64
                ERROR        134.87        14            9.63
                TOTAL        244.00        29
                GROUP F        0.22      DF =  1,14
                SUBJECT F      0.79      DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                               GIRLS
 SOURCE         SS          DF         MS          SS          DF         MS
 GROUP        10.08         1        10.08        0.50         1         0.50
 SUBJECT      50.42         5        10.08       56.44         8         7.06
 ERROR        50.42         5        10.08       76.00         8         9.50
 TOTAL       110.92        11                   132.94        17
 GROUP F       1.00       DF =  1, 5             0.05       DF =  1, 8
 SUBJECT F     1.00       DF =  5, 5             0.74       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

```
                              TABLE 39

   FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                     UNDER GROUPS OF SCORES OF:

**********************************************************************
      37.  ARTICULATION TESTING (TOTAL ARTICULATORY ERRORS).
----------------------------------------------------------------------

                       EE         LE         XBAR   SEX

              1       0.00       0.00       0.00    M
              2      15.00       0.00       7.50    F
              3       0.00      11.00       5.50    F
              4       0.00       0.00       0.00    M
              5       0.00       0.00       0.00    F
              6       0.00       0.00       0.00    F
              7       0.00       0.00       0.00    M

         MEANS        2.14       1.57

              8       0.00       0.00       0.00    M
              9      14.00       0.00       7.00    M
             10       0.00      11.00       5.50    F
             11      15.00       0.00       7.50    F
             12       7.00       0.00       3.50    M
             13       0.00       0.00       0.00    F
             14       0.00       0.00       0.00    F
             15       0.00       0.00       0.00    F

         MEANS        4.50       1.38
   TOTAL MEANS        3.40       1.47       2.43
                               GROUP
              SOURCE          SS        DF         MS
              GROUP          28.03       1        28.03
              SUBJECT       290.87      14        20.78
              ERROR         440.47      14        31.46
              TOTAL         759.37      29
              GROUP F         0.89     DF =  1,14
              SUBJECT F       0.66     DF = 14,14

              LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                             GIRLS
 SOURCE         SS        DF        MS          SS        DF          MS
 GROUP         36.75      1        36.75        3.56      1          3.56
 SUBJECT       85.75      5        17.15      195.78      8         24.47
 ERROR         85.75      5        17.15      342.44      8         42.81
 TOTAL        208.25     11                   541.78     17
 GROUP F        2.14     DF =  1, 5             0.08     DF =  1, 8
 SUBJECT F      1.00     DF =  5, 5             0.57     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

```
                              TABLE 40


  FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                    UNDER GROUPS OF SCORES OF:

==================================================================
    30.  TEACHERS' RATINGS OF EACH SUBJECT FOR INFLECTION OF
                  GENERAL SPEECH PRODUCTION.
------------------------------------------------------------------

                       EE          LE          XBAR  SEX

              1       4.00        2.00        3.00    M
              2       3.00        1.00        2.00    F
              3       3.00        1.00        2.00    F
              4       4.00        3.00        3.50    M
              5       3.00        2.00        2.50    F
              6       3.00        1.00        2.00    F
              7       3.00        3.00        3.00    M

      MEANS           3.29        1.86

              8       3.00        3.00        3.00    M
              9       2.00        1.00        1.50    M
             10       3.00        1.00        2.00    F
             11       3.00        2.00        2.50    F
             12       2.00        3.00        2.50    M
             13       3.00        1.00        2.00    F
             14       2.00        2.00        2.00    F
             15       4.00        1.00        2.50    F

      MEANS           2.75        1.75
TOTAL MEANS           3.00        1.83        2.40
                                GROUP
             SOURCE          SS          DF          MS
             GROUP          10.80         1         10.80
             SUBJECT         8.20        14          0.59
             ERROR           8.20        14          0.59
             TOTAL          27.20        29
             GROUP F        18.44       DF =  1,14
             SUBJECT F       1.00       DF = 14,14
             EE>VS. LE SIGNIFICANT AT .05 LEVEL

                     BOYS                                GIRLS
SOURCE          SS       DF        MS           SS        DF         MS
GROUP          0.75       1       0.75         12.50       1       12.50
SUBJECT        4.75       5       0.95          1.00       8        0.13
ERROR          2.75       5       0.55          3.00       8        0.38
TOTAL          8.25      11                    16.50      17
GROUP F        1.36     DF =  1, 5             33.33      DF =  1, 8
SUBJECT F      1.73     DF =  5, 5              0.33      DF =  8, 8

EE>VS. LE NOT SIGNIFICANT AT .05 LEVEL EE>VS. LE SIGNIFICANT AT .05 LEVEL
==================================================================
                              TABLE 41

       FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF:

   ========================================================================
39.  TEACHERS' RATINGS OF EACH SUBJECT FOR GENERAL LANGUAGE DEVELOPMENT ABILITIES
   ------------------------------------------------------------------------

                           EE          LE          XBAR   SEX

                   1      3.00        2.00         2.50   M
                   2      4.00        2.00         3.00   F
                   3      2.00        2.00         2.00   F
                   4      3.00        3.00         3.00   M
                   5      4.00        3.00         3.50   F
                   6      3.00        1.00         2.00   F
                   7      3.00        3.00         3.00   M

           MEANS          3.14        2.29

                   8      4.00        2.00         3.00   M
                   9      3.00        1.00         2.00   M
                  10      3.00        1.00         2.00   F
                  11      4.00        3.00         3.50   F
                  12      3.00        3.00         3.00   M
                  13      3.00        1.00         2.00   F
                  14      5.00        3.00         4.00   F
                  15      3.00        1.00         2.00   F

           MEANS          3.50        1.88
     TOTAL MEANS          3.33        2.07         2.70
                             GROUP
                SOURCE         SS          DF           MS
                GROUP        12.03          1        12.03
                SUBJECT      12.80         14         0.91
                ERROR         5.47         14         0.39
                TOTAL        30.30         29
                GROUP F      30.82       DF =  1,14
                SUBJECT F     2.34       DF = 14,14

                LE>VS EE  SIGNIFICANT AT .05 LEVEL

                             BOYS                            GIRLS
   SOURCE          SS         DF          MS          SS        DF          MS
   GROUP          2.08         1         2.08       10.89        1        10.89
   SUBJECT        1.75         5         0.35       11.00        8         1.38
   ERROR          2.42         5         0.48        2.11        8         0.26
   TOTAL          6.25        11                    24.00       17
   GROUP F        4.31      DF =  1, 5             41.26      DF =  1, 8
   SUBJECT F      0.72      DF =  5, 5              5.21      DF =  8, 8

   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
   ========================================================================
```

TABLE 42

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF TOTAL RATINGS OF INFLECTION OF EACH SUBJECT WITH NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

		(WITH EXPERIENCE)								(WITHOUT EXPERIENCE)				
		RATER R1	RATER R2	RATER R3	RATER R4	RATER R5	RATER R6	RATER R7	RATER R8	RATER R9	RATER 10	RATER 11	RATER 12	RATER 13
1	EE	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2	EE	2.00	2.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	4.00	3.00
3	EE	2.00	2.00	4.00	4.00	5.00	3.00	4.00	3.00	2.00	3.00	4.00	4.00	4.00
4	EE	3.00	3.00	4.00	3.00	5.00	4.00	4.00	4.00	5.00	4.00	4.00	4.00	4.00
5	EE	3.00	4.00	3.00	3.00	4.00	3.00	3.00	3.00	4.00	3.00	3.00	4.00	4.00
6	EE	1.00	2.00	2.00	3.00	2.00	2.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00
7	EE	4.00	3.00	4.00	3.00	5.00	4.00	4.00	3.00	3.00	5.00	4.00	3.00	4.00
MEANS		2.71	2.86	3.43	3.14	4.00	3.29	3.57	3.29	3.43	3.43	3.43	3.71	3.71
8	EE	3.00	4.00	2.00	3.00	4.00	4.00	3.00	3.00	3.00	4.00	3.00	3.00	4.00
9	EE	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	2.00	3.00	2.00	3.00	3.00
10	EE	3.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	2.00	3.00	3.00
11	EE	3.00	2.00	2.00	3.00	4.00	4.00	3.00	3.00	4.00	3.00	3.00	3.00	3.00
12	EE	1.00	2.00	2.00	3.00	1.00	3.00	2.00	2.00	3.00	4.00	2.00	3.00	3.00
13	EE	4.00	3.00	3.00	3.00	1.00	3.00	3.00	3.00	3.00	4.00	4.00	3.00	3.00
14	EE	4.00	4.00	3.00	3.00	3.00	4.00	3.00	2.00	4.00	3.00	3.00	4.00	4.00
15	EE	4.00	4.00	3.00	3.00	4.00	3.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	2.75	2.50	3.00	2.75	3.38	2.88	2.75	3.00	3.25	2.75	3.13	3.25
TOTAL MEANS		2.87	2.80	2.93	3.07	3.33	3.33	3.20	3.00	3.20	3.33	3.07	3.40	3.47
1	LE	3.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00
2	LE	2.00	4.00	3.00	2.00	2.00	4.00	4.00	1.00	1.00	2.00	3.00	3.00	3.00
3	LE	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	3.00	1.00	2.00	2.00	2.00
4	LE	3.00	2.00	3.00	4.00	3.00	4.00	4.00	3.00	1.00	2.00	4.00	4.00	4.00
5	LE	3.00	3.00	3.00	4.00	3.00	3.00	4.00	2.00	2.00	3.00	3.00	3.00	4.00
6	LE	2.00	2.00	1.00	2.00	2.00	3.00	3.00	1.00	5.00	2.00	2.00	3.00	3.00
7	LE	3.00	4.00	3.00	4.00	5.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00
MEANS		2.43	2.57	2.14	2.57	2.43	3.00	3.29	1.86	2.57	2.29	2.86	3.14	3.14
8	LE	4.00	2.00	3.00	4.00	3.00	4.00	4.00	3.00	3.00	2.00	4.00	3.00	2.00
9	LE	2.00	3.00	1.00	2.00	2.00	4.00	3.00	1.00	5.00	5.00	2.00	3.00	3.00
10	LE	2.00	1.00	3.00	2.00	1.00	2.00	2.00	1.00	3.00	2.00	2.00	2.00	2.00
11	LE	4.00	2.00	1.00	1.00	1.00	3.00	2.00	2.00	4.00	3.00	3.00	2.00	3.00
12	LE	4.00	1.00	1.00	2.00	1.00	4.00	3.00	3.00	2.00	2.00	3.00	3.00	3.00
13	LE	2.00	2.00	2.00	2.00	2.00	3.00	3.00	1.00	5.00	4.00	3.00	3.00	4.00
14	LE	3.00	2.00	3.00	3.00	3.00	3.00	3.00	2.00	2.00	1.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	2.00	3.00	1.00	4.00	4.00	4.00	3.00	4.00
MEANS		3.00	2.00	2.13	2.38	2.00	3.13	2.88	1.75	3.50	2.88	3.00	2.75	3.00
TOTAL MEANS		2.73	2.27	2.13	2.47	2.20	3.07	3.07	1.80	3.07	2.60	2.93	2.93	3.07

```
                              TABLE 42 (CONT'D)

                                        EE                   LE                  YEAR
    W/  EDUCATIONAL EXPERIENCE        3.067                2.467                2.767
    W/O EDUCATIONAL EXPERIENCE        3.293                2.920                3.107
                          MEAN        3.154                2.641                2.897

SOURCE                                        SS          DF          MS            F

SS RATER                                    29.497        12        2.458         4.603
  SS EXPERIENCE OF RATER                    10.671         1       10.671        19.981
  SS RATER EFFECT NOT DUE TO EXPERIENCE     18.827        11        1.712         3.205
  RATER EFFECTS          (VARIANCE EXPLAINED)                        (      PER CENT)

SS SUBJECTS                                141.897        29        4.893         9.162
  SS GROUPS OF SUBJECTS                     25.641         1       25.641        48.012
  SS SUBJECT EFFECT NOT DUE TO GROUPS      116.256        28        4.152         7.775


SS EXPERIENCE OF RATER X GROUPS              1.186         1        1.186         2.220


SS ERROR                                   185.317       347        0.534

SS TOTAL                                   357.897       389

RATER F        4.603     DF = 12,347  W/ EXP>VS. W/OEXP     SIGNIFICANT AT .05 LEVEL
GROUP F       48.012     DF =  1,347  LE>VS. EE             SIGNIFICANT AT .05 LEVEL
SUBJECT F      9.162     DF = 29,347  LE>VS. EE             SIGNIFICANT AT .05 LEVEL
=====================================================================================
                                  TABLE 43

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                          UNDER GROUPS OF SCORES OF:

   ================================================================================
41.  TOTAL RATINGS OF INFLECTIONS OF GENERAL SPEECH PRODUCTION OF EACH SUBJECT.
   --------------------------------------------------------------------------------

                              EE          LE          XBAR    SEX

                      1      48.00       23.00        35.50    M
                      2      32.00       33.00        32.50    F
                      3      41.00       18.00        29.50    F
                      4      47.00       38.00        42.50    M
                      5      41.00       38.00        39.50    F
                      6      29.00       30.00        29.50    F
                      7      47.00       47.00        47.00    M

              MEANS          40.71       32.43

                      8      40.00       38.00        39.00    M
                      9      30.00       35.00        32.50    M
                     10      33.00       24.00        28.50    F
                     11      37.00       29.00        33.00    F
                     12      29.00       29.00        29.00    M
                     13      35.00       35.00        35.00    F
                     14      42.00       32.00        37.00    F
                     15      39.00       39.00        39.00    F

              MEANS          35.63       32.63
        TOTAL MEANS          38.00       32.53        35.27
                                      GROUP
                     SOURCE          SS         DF        MS
                     GROUP         224.13        1      224.13
                     SUBJECT       821.87       14       58.70
                     ERROR         535.87       14       38.28
                     TOTAL        1581.87       29
                     GROUP F         5.86      DF =  1,14
                     SUBJECT F       1.53      DF = 14,14

                     LE>VS EE  SIGNIFICANT AT .05 LEVEL

                             BOYS                                  GIRLS
 SOURCE          SS          DF         MS           SS          DF          MS
 GROUP          80.08         1        80.08       144.50         1        144.50
 SUBJECT       437.42         5        87.48       277.11         8         34.64
 ERROR         287.42         5        57.48       248.00         8         31.00
 TOTAL         804.92        11                    669.61        17
 GROUP F         1.39      DF =  1, 5                4.66      DF =  1, 8
 SUBJECT F       1.52      DF =  5, 5                1.12      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
================================================================================
                              TABLE 44

       FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF
======================================================================
  42.  INFLECTION RATER RANKS OF EACH SUBJECT OF 2 GROUPS:EE VS LE
       DATA OF RANKED SCORES OF ALL INFLECTION SPEECH VARIABLES
----------------------------------------------------------------------
             RATER NUMBER          EE                  LE

                   1              5.00                1.00
                   2              5.00                1.00
                   3              5.00                1.00
                   4              5.00                1.00
                   5              5.00                1.00
                   6              5.00                1.00
                   7              5.00                1.00
                   8              5.00                1.00
                   9              5.00                1.00
                  10              5.00                1.00
                  11              5.00                1.00
                  12              5.00                1.00
                  13              5.00                1.00

NOTE: INFLECTION RANK ORDER     1.00= HIGH     5.00= LOW       2.50=TIE


                  MEAN           VAR           SD           N

             1 EE 5.00           .00           .00         13
             2 LE 1.00           .00           .00         13

                  SUM OF X        SUM OF X SQ          N

             1 EE   65.00          325.00             13
             2 LE   13.00           13.00             13

             SOURCE     SUM OF SQUARES      DF     MEAN SQUARE

             BETWEEN        104.00            1       104.00
             WITHIN           0.00           24         0.00
             TOTAL          104.00           25
             F=             ******     (IS INDETERMINANT)
             LE>VS EE  SIGNIFICANT AT .05 LEVEL
======================================================================
                              TABLE 45

         FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE OF SCORES OF
======================================================================
                       43.  RATERS OF INFLECTION
  W/ EDUCATIONAL EXPERIENCE VS. RATERS W/O EDUCATIONAL EXPERIENCE.
----------------------------------------------------------------------

                   MEAN           VAR         SD         N

         1 W/EXP   3.00          4.27        2.07       16
         2 WO/EXP  3.00          4.44        2.11       10

                   SUM OF X      SUM OF X SQ       N

         1 W/EXP    48.00          208.00         16
         2 WO/EXP   30.00          130.00         10

         SOURCE   SUM OF SQUARES       DF     MEAN SQUARE

         BETWEEN          .00           1          .00
         WITHIN        104.00          24         4.33
         TOTAL         104.00          25
         F=              0.00
         W/O EXP>VS.W/ EXP NOT SIGNIFICANT AT .05 LEVEL
======================================================================
                              TABLE 46

        FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

****************************************************************************
                            (AGE EQUIVALENTS).
 44.  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL WORDS).
----------------------------------------------------------------------------

                          EE           LE          XBAR   SEX

                 1        8.00         9.00         8.50   M
                 2        8.00         9.00         8.50   F
                 3        9.00         8.00         8.50   F
                 4        8.00         8.00         8.00   M
                 5        8.00         8.00         8.00   F
                 6        7.00        10.00         8.50   F
                 7        7.00         8.00         7.50   M

          MEANS           7.86         8.57

                 8        9.00         8.00         8.50   M
                 9        8.00         8.00         8.00   M
                10        8.00         7.00         7.50   F
                11        8.00        17.00        12.50   F
                12       16.00         9.00        12.50   M
                13        8.00        12.00        10.00   F
                14        8.00         8.00         8.00   F
                15        8.00        11.00         9.50   F

          MEANS           9.13        10.00
    TOTAL MEANS           8.53         9.33         8.93
                                GROUP
                SOURCE         SS           DF          MS
                GROUP           4.80         1           4.80
                SUBJECT        70.87        14           5.06
                ERROR          80.20        14           5.73
                TOTAL         155.87        29
                GROUP F         0.84       DF =  1,14
                SUBJECT F       0.88       DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                GIRLS
 SOURCE          SS        DF          MS          SS         DF          MS
 GROUP          3.00        1          3.00       18.00        1         18.00
 SUBJECT       33.67        5          6.73       37.00        8          4.63
 ERROR         23.00        5          4.60       41.00        8          5.13
 TOTAL         59.67       11                     96.00       17
 GROUP F        0.65      DF =  1, 5               3.51      DF =  1, 8
 SUBJECT F      1.46      DF =  5, 5               0.90      DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
****************************************************************************
```

```
                                TABLE 47

          FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                         UNDER GROUPS OF SCORES OF:

************************************************************************
                              (PERCENTILE)
  45.  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL WORDS).
------------------------------------------------------------------------

                        EE          LE          XBAR   SEX

               1      30.00       25.00        27.50    M
               2      40.00       30.00        35.00    F
               3      60.00       10.00        35.00    F
               4      15.00       10.00        12.50    M
               5      15.00       10.00        12.50    F
               6       5.00       45.00        25.00    F
               7       2.00       20.00        11.00    M

          MEANS       23.86       21.43

               8      10.00       10.00        10.00    M
               9       2.00       10.00         6.00    M
              10      10.00        5.00         7.50    F
              11      10.00       55.00        32.50    F
              12      50.00       20.00        35.00    M
              13       5.00       45.00        25.00    F
              14      95.00        5.00        50.00    F
              15       5.00       30.00        17.50    F

          MEANS       23.38       22.50
    TOTAL MEANS       23.60       22.00        22.80
                                  GROUP
               SOURCE          SS         DF          MS
               GROUP          19.20        1         19.20
               SUBJECT      4743.80       14        338.84
               ERROR        8949.00       14        639.27
               TOTAL       13712.80       29
               GROUP F         0.03     DF =  1,14
               SUBJECT F       0.53     DF = 14,14

               EE>VS LE  NOT SIGNIFICANT AT .05 LEVEL

                              BOYS                               GIRLS
 SOURCE          SS          DF         MS          SS          DF          MS
 GROUP          16.33         1        16.33        5.56         1          5.56
 SUBJECT      1321.04         5       264.20     2750.00         8        343.75
 ERROR         652.67         5       130.53     8294.44         8       1036.81
 TOTAL        1990.00        11                 11050.00        17
 GROUP F         0.13      DF =  1, 5              0.01       DF =  1, 8
 SUBJECT F       2.02      DF =  5, 5              0.33       DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
************************************************************************
```

```
                              TABLE 48

      FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

*********************************************************************
                              (STANINE)
 48.  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL WORDS).
---------------------------------------------------------------------

                          EE          LE          XBAR   SEX

                 1        4.00        4.00        4.00    M
                 2        5.00        4.00        4.50    F
                 3        5.00        2.00        3.50    F
                 4        3.00        3.00        3.00    M
                 5        3.00        2.00        2.50    F
                 6        2.00        5.00        3.50    F
                 7        1.00        3.00        2.00    M

          MEANS           3.29        3.29

                 8        3.00        3.00        3.00    M
                 9        1.00        2.00        1.50    M
                10        2.00        2.00        2.00    F
                11        3.00        6.00        4.50    F
                12        5.00        3.00        4.00    M
                13        2.00        6.00        4.00    F
                14        8.00        1.00        4.50    F
                15        2.00        4.00        3.00    F

          MEANS           3.25        3.38
    TOTAL MEANS           3.27        3.33        3.30
                                 GROUP
                 SOURCE          SS          DF          MS
                 GROUP          0.03          1         0.03
                 SUBJECT       26.80         14         1.91
                 ERROR         53.47         14         3.82
                 TOTAL         88.30         29
                 GROUP F        0.01       DF =  1,14
                 SUBJECT F      0.50       DF = 14,14

                 LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                                GIRLS
 SOURCE        SS         DF         MS           SS          DF          MS
 GROUP        0.08         1        0.08         0.00          1         0.00
 SUBJECT     10.42         5        2.08        13.44          8         1.68
 ERROR        4.42         5        0.88        49.03          8         6.13
 TOTAL       14.92        11                    62.44         17
 GROUP F      0.09      DF =  1, 5               0.00       DF =  1, 8
 SUBJECT F    2.36      DF =  5, 5               0.27       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
*********************************************************************
```

TABLE 49

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
*************************************************************************
                          (AGE EQUIVALENTS)
47,  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL SENTENCES),
-------------------------------------------------------------------------

                          EE          LE          XBAR    SEX

                1        8.00        9.00         8.50    M
                2        8.00        9.00         8.50    F
                3        9.00        8.00         8.50    F
                4        7.00       70.00        38.50    M
                5        7.00        7.00         7.00    F
                6        7.00        9.00         8.00    F
                7        7.00        9.00         8.00    M

        MEANS            7.57       17.29

                8        9.00        8.00         8.50    M
                9        7.00        8.00         7.50    M
               10        7.00        7.00         7.00    F
               11        7.00       11.00         9.00    F
               12       11.00        8.00         9.50    M
               13        7.00        9.00         8.00    F
               14        8.00        7.00         7.50    F
               15        7.00        9.00         8.00    F

        MEANS            7.88        8.38
  TOTAL MEANS            7.73       12.53        10.13
                                   GROUP
               SOURCE         SS          DF          MS
               GROUP        172.80         1        172.80
               SUBJECT     1737.47        14        124.10
               ERROR       1835.20        14        131.09
               TOTAL       3745.47        29
               GROUP F        1.32      DF =  1,14
               SUBJECT F      0.95      DF = 14,14

               LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                                GIRLS
SOURCE          SS         DF         MS            SS          DF          MS
GROUP         330.75        1       330.75         4.50          1         4.50
SUBJECT      1514.42        5       302.88         7.44          8         0.93
ERROR        1661.75        5       332.35        11.00          8         1.37
TOTAL        3506.92       11                     22.94         17
GROUP F         1.00      DF =  1, 5               3.27       DF =  1, 8
SUBJECT F       0.91      DF =  5, 5               0.68       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
*************************************************************************
```

TABLE 50

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
=========================================================================
                             (PERCENTILE)
4A.  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL SENTENCES).
-------------------------------------------------------------------------

                          EE          LE          XBAR    SEX

               1        35.00       45.00        40.00     M
               2        45.00       55.00        50.00     F
               3        45.00       40.00        42.50     F
               4        15.00       15.00        15.00     M
               5        25.00       15.00        20.00     F
               6         2.00       55.00        28.50     F
               7         5.00       40.00        22.50     M

          MEANS         24.57       37.86

               8        40.00       18.00        29.00     M
               9        10.00       15.00        12.50     M
              10        18.00       20.00        19.00     F
              11        15.00       60.00        37.50     F
              12        55.00       50.00        52.50     M
              13        10.00       55.00        32.50     F
              14        45.00       15.00        30.00     F
              15        10.00       60.00        35.00     F

          MEANS         25.38       36.63
    TOTAL MEANS         25.00       37.20        31.10
                                 GROUP
                SOURCE         SS          DF         MS
                GROUP        1116.30        1       1116.30
                SUBJECT      4087.20       14        291.94
                ERROR        5057.20       14        361.23
                TOTAL       10260.70       29
                GROUP F         3.09      DF =  1,14
                SUBJECT F       0.81      DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                                  GIRLS
SOURCE         SS          DF          MS          SS            DF          MS
GROUP          44.08        1          44.08     1422.22          1        1422.22
SUBJECT      2365.42        5         473.08     1595.11          8         199.39
ERROR         885.42        5         177.08     3821.78          8         477.72
TOTAL        3294.92       11                    6839.11         17
GROUP F         0.25      DF =  1, 5                2.98       DF =  1, 8
SUBJECT F       2.67      DF =  5, 5                0.42       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=========================================================================
```

TABLE 51

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

```
=========================================================================
                              (STANINE)
49.  MYKLEBUST PICTURE STORY LANGUAGE TEST (PRODUCTIVITY TOTAL SENTENCES).
-------------------------------------------------------------------------

                       EE          LE          XBAR   SEX

               1       3.00        5.00         4.00   M
               2       5.00        6.00         5.50   F
               3       6.00        5.00         5.50   F.
               4       3.00        3.00         3.00   M
               5       4.00        3.00         3.50   F
               6       1.00        5.00         3.00   F
               7       2.00        5.00         3.50   M

         MEANS         3.43        4.57

               8       4.00        3.00         3.50   M
               9       3.00        3.00         3.00   M
              10       3.00        3.00         3.00   F
              11       3.00        6.00         4.50   F
              12       5.00        5.00         5.00   M
              13       3.00        5.00         4.00   F
              14       5.00        4.00         4.50   F
              15       3.00        6.00         4.50   F

         MEANS         3.63        4.38
   TOTAL MEANS         3.53        4.47         4.00
                                GROUP
              SOURCE          SS          DF          MS
              GROUP          6.53          1         6.53
              SUBJECT       22.00         14         1.57
              ERROR         21.47         14         1.53
              TOTAL         50.00         29
              GROUP F        4.26       DF =  1,14
              SUBJECT F      1.02       DF = 14,14

              LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                        BOYS                                 GIRLS
SOURCE            SS     DF        MS          SS         DF           MS
GROUP            1.33     1        1.33        5.56        1           5.56
SUBJECT          5.67     5        1.13       14.11        8           1.76
ERROR            5.67     5        1.13       15.44        8           1.93
TOTAL           12.67    11                   35.11       17
GROUP F          1.16   DF =  1, 5             2.88     DF =  1, 8
SUBJECT F        1.00   DF =  5, 5             0.91     DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .25 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=========================================================================
                                TABLE 52

         FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                          UNDER GROUPS OF SCORES OF:

=====================================================================
                            (AGE EQUIVALENTS)
     50.  MYKLEBUST PICTURE STORY LANGUAGE TEST (WORDS PER SENTENCE).
---------------------------------------------------------------------

                         EE          LE          XBAR    SEX

               1        9.00       10.00         9.50     M
               2        7.00        8.00         7.50     F
               3        8.00        8.00         8.00     F
               4       10.00       11.00        10.50     M
               5       11.00       15.00        13.00     F
               6       17.00       10.00        13.50     F
               7        9.00        9.00         9.00     M

          MEANS        10.14       10.14

               8        9.00       13.00        11.00     M
               9       10.00       12.00        11.00     M
              10       11.00        9.00        10.00     F
              11       12.00       14.00        13.00     F
              12       13.00       17.00        15.00     M
              13       12.00       13.00        12.50     F
              14        8.00       12.00        10.00     F
              15       13.00       12.00        12.50     F

          MEANS        11.00       12.75
    TOTAL MEANS        10.60       11.53        11.07
                                GROUP
                SOURCE        SS         DF           MS
                GROUP        6.53         1          6.53
                SUBJECT    128.87        14          9.20
                ERROR       58.47        14          4.18
                TOTAL      193.87        29
                GROUP F      1.56       DF =  1,14
                SUBJECT F    2.20       DF = 14,14

                LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                         BOYS                               GIRLS
 SOURCE        SS        DF          MS          SS          DF          MS
 GROUP       12.00        1        12.00         0.22         1          0.22
 SUBJECT     45.00        5         9.00        83.78         8         10.47
 ERROR        7.00        5         1.40        45.78         8          5.72
 TOTAL       64.00       11                    129.78        17
 GROUP F      8.57      DF =  1, 5               0.04      DF =  1, 8
 SUBJECT F    6.43      DF =  5, 5               1.83      DF =  8, 8

LE>VS EE SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=====================================================================
                              TABLE 53

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

======================================================================
                            (PERCENTILE)
   51.  MYKLEBUST PICTURE STORY LANGUAGE TEST (WORDS PER SENTENCE).
----------------------------------------------------------------------

                      EE          LE          XBAR   SEX

             1      46.00       53.00        49.50    M
             2      10.00       30.00        20.00    F
             3      35.00       15.00        25.00    F
             4      65.00       70.00        67.50    M
             5      20.00       85.00        52.50    F
             6      98.00       38.00        68.00    F
             7      25.00       38.00        31.50    M

       MEANS        42.71       47.00

             8      10.00       50.00        30.00    M
             9      30.00       45.00        37.50    M
            10      35.00       20.00        27.50    F
            11      35.00       85.00        60.00    F
            12      45.00       70.00        57.50    M
            13      20.00       45.00        32.50    F
            14       2.00       25.00        13.50    F
            15      54.00       45.00        49.50    F

       MEANS        28.88       48.13
 TOTAL MEANS        35.33       47.60        41.47
                              GROUP
            SOURCE         SS          DF          MS
            GROUP        1128.53        1       1128.53
            SUBJECT      8538.47       14        609.89
            ERROR        6510.47       14        465.03
            TOTAL       16177.47       29
            GROUP F         2.43      DF =  1,14
            SUBJECT F       1.31      DF = 14,14

            LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                             BOYS                          GIRLS
 SOURCE          SS          DF          MS          SS         DF          MS
 GROUP         918.75         1        918.75      306.72        1        306.72
 SUBJECT      2288.40         5        457.68     5911.11        8        738.89
 ERROR         427.75         5         85.55     5945.78        8        743.22
 TOTAL        3634.92        11                  12203.61       17
 GROUP F        10.74     DF =  1, 5                 0.47     DF =  1, 8
 SUBJECT F       5.35     DF =  5, 5                 0.99     DF =  8, 8

 LE>VS EE SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
==========================================================================
                                   TABLE 54

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF:

=========================================================================
                               (STANINE)
   52.  MYKLEBUST PICTURE STORY LANGUAGE TEST (WORDS PER SENTENCE).
-------------------------------------------------------------------------

                            EE          LE          XBAR   SEX

                    1      4.00        5.00        4.50    M
                    2      2.00        4.00        3.00    F
                    3      4.00        3.00        3.50    F
                    4      6.00        6.00        6.00    M
                    5      3.00        7.00        5.00    F
                    6      9.00        4.00        6.50    F
                    7      4.00        4.00        4.00    M

             MEANS         4.57        4.71

                    8      2.00        5.00        3.50    M
                    9      4.00        5.00        4.50    M
                   10      5.00        5.00        5.00    F
                   11      5.00        6.00        5.50    F
                   12      5.00        7.00        6.00    M
                   13      4.00        5.00        4.50    F
                   14      1.00        4.00        2.50    F
                   15      5.00        4.00        4.50    F

             MEANS         3.88        5.13
       TOTAL MEANS         4.20        4.93        4.57
                                  GROUP
                  SOURCE        SS        DF         MS
                  GROUP         4.03       1         4.03
                  SUBJECT      36.87      14         2.63
                  ERROR        32.47      14         2.32
                  TOTAL        73.37      29
                  GROUP F       1.74     DF =  1,14
                  SUBJECT F     1.14     DF = 14,14

                  LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                               GIRLS
 SOURCE          SS        DF         MS          SS         DF         MS
 GROUP          4.08       1         4.08        0.89        1         0.89
 SUBJECT       10.75       5         2.15       25.44        8         3.18
 ERROR          3.42       5         0.68       28.11        8         3.51
 TOTAL         18.25      11                    54.44       17
 GROUP F        5.98      DF =  1, 5             0.25       DF =  1, 8
 SUBJECT F      3.15      DF =  5, 5             0.91       DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
=========================================================================
                              TABLE 55

   FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                    UNDER GROUPS OF SCORES OF:

========================================================================
                        (AGE EQUIVALENTS)
   55.  MYKLEBUST PICTURE STORY LANGUAGE TEST (SYNTAX QUOTIENT).
------------------------------------------------------------------------

                          EE         LE         XBAR    SEX

                 1      12.00      16.00       14.00     M
                 2       9.00      16.00       12.50     F
                 3       9.00      16.00       12.50     F
                 4       9.00      16.00       12.50     M
                 5      10.00      16.00       13.00     F
                 6       8.00      16.00       12.00     F
                 7       9.00      16.00       12.50     M

        MEANS            9.43      16.00

                 8      10.00      16.00       13.00     M
                 9       8.00      16.00       12.00     M
                10       9.00      16.00       12.50     F
                11      15.00      16.00       15.50     F
                12      17.00      16.00       16.50     M
                13      17.00      16.00       16.50     F
                14       8.00      16.00       12.00     F
                15      11.00      16.00       13.50     F

        MEANS           11.88      16.00
  TOTAL MEANS           10.73      16.00       13.37
                                  GROUP
                SOURCE          SS          DF          MS
                GROUP         208.03         1        208.03
                SUBJECT        68.47        14          4.89
                ERROR          68.47        14          4.89
                TOTAL         344.97        29
                GROUP F        42.54        DF =  1,14
                SUBJECT F       1.00        DF = 14,14

                LE>VS EE  SIGNIFICANT AT .05 LEVEL

                           BOYS                                  GIRLS
 SOURCE          SS         DF         MS          SS         DF          MS
 GROUP         80.08         1       80.08       128.00        1       128.00
 SUBJECT       27.42         5        5.48        41.00        8         5.13
 ERROR         27.42         5        5.48        41.00        8         5.13
 TOTAL        134.92        11                   210.00       17
 GROUP F       14.60       DF =  1, 5             24.98      DF =  1, 8
 SUBJECT F      1.00       DF =  5, 5              1.00      DF =  8, 8

LE>VS EE SIGNIFICANT AT .05 LEVEL   LE>VS EE SIGNIFICANT AT .05 LEVEL
========================================================================
                                TABLE 56


       FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                       UNDER GROUPS OF SCORES OF:

**********************************************************************
                             (PERCENTILE)
    54.  MYKLEBUST PICTURE STORY LANGUAGE TEST (SYNTAX QUOTIENT).
----------------------------------------------------------------------

                        EE          LE          XBAR    SEX

                 1      45.00       40.00       42.50    M
                 2      30.00       90.00       60.00    F
                 3      35.00       20.00       27.50    F
                 4      25.00       30.00       27.50    M
                 5      30.00        5.00       17.50    F
                 6      25.00      100.00       62.50    F
                 7      20.00       98.00       59.00    M

          MEANS         30.00       54.71

                 8      25.00       55.00       40.00    M
                 9       2.00       40.00       21.00    M
                10      20.00       35.00       27.50    F
                11      50.00       80.00       65.00    F
                12      45.00       30.00       37.50    M
                13      85.00       80.00       82.50    F
                14      40.00       90.00       65.00    F
                15      40.00       98.00       69.00    F

          MEANS         38.38       63.50
    TOTAL MEANS         34.47       59.40       46.93
                                 GROUP
                SOURCE          SS          DF          MS
                GROUP         4662.53        1       4662.53
                SUBJECT      11543.87       14        827.42
                ERROR         8233.47       14        588.10
                TOTAL        24479.87       29
                GROUP F          7.93      DF =  1,14
                SUBJECT F        1.41      DF = 14,14

                LE>VS EE  SIGNIFICANT AT .05 LEVEL

                            BOYS                              GIRLS
SOURCE          SS          DF          MS          SS          DF          MS
GROUP        1430.08         1       1430.08     3280.50         1     3280.50
SUBJECT      1729.42         5        345.88     8228.44         8     1028.56
ERROR        2921.42         5        584.28     5264.00         8      658.00
TOTAL        6080.92        11                  16772.94        17
GROUP F         2.45      DF =  1, 5               4.99      DF =  1, 8
SUBJECT F       0.59      DF =  5, 5               1.56      DF =  8, 8

LE>VS EE NOT SIGNIFICANT AT .25 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

TABLE 57

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
UNDER GROUPS OF SCORES OF:

(STANINE)
55. MYKLEBUST PICTURE STORY LANGUAGE TEST (SYNTAX QUOTIENT).

	EE	LE	XBAR	SEX
1	6.00	5.00	5.50	M
2	4.00	7.00	5.50	F
3	4.00	3.00	3.50	F
4	4.00	4.00	4.00	M
5	4.00	2.00	3.00	F
6	4.00	9.00	6.50	F
7	4.00	9.00	6.50	M
MEANS	4.29	5.57		
8	3.00	4.00	3.50	M
9	1.00	4.00	2.50	M
10	4.00	4.00	4.00	F
11	5.00	7.00	6.00	F
12	5.00	3.00	4.00	M
13	8.00	7.00	7.50	F
14	5.00	7.00	6.00	F
15	4.00	9.00	6.50	F
MEANS	4.38	5.63		
TOTAL MEANS	4.33	5.60	4.97	

GROUP

SOURCE	SS	DF	MS
GROUP	12.03	1	12.03
SUBJECT	66.47	14	4.75
ERROR	44.47	14	3.18
TOTAL	122.97	29	
GROUP F	3.79	DF = 1,14	
SUBJECT F	1.49	DF = 14,14	

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL

	BOYS			GIRLS		
SOURCE	SS	DF	MS	SS	DF	MS
GROUP	3.00	1	3.00	9.39	1	9.39
SUBJECT	20.67	5	4.13	37.78	8	4.72
ERROR	17.00	5	3.40	27.11	8	3.39
TOTAL	40.67	11		74.28	17	
GROUP F	0.88	DF = 1, 5		2.77	DF = 1, 8	
SUBJECT F	1.22	DF = 5, 5		1.39	DF = 8, 8	

LE>VS EE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL

TABLE 58

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED UNDER GROUPS OF SCORES OF:

```
**********************************************************************
                         (AGE EQUIVALENTS)
     58.  MYKLEBUST PICTURE STORY LANGUAGE TEST (ABSTACT-CONCRETE).
----------------------------------------------------------------------

                       EE          LE          XBAR    SEX

               1      14.00       11.00       12.50     M
               2      11.00       17.00       14.00     F
               3      17.00       10.00       13.50     F
               4       8.00        8.00        8.00     M
               5       7.00       14.00      .10.50     F
               6      17.00       13.00       15.00     F
               7       8.00        8.00        6.00     M

       MEANS          11.71       11.57

               8       7.00        7.00        7.00     M
               9       8.00       17.00       12.50     M
              10      17.00       17.00       17.00   . F
              11      17.00       17.00       17.00     F
              12      17.00        7.00       12.00     M
              13      17.00       17.00       17.00     F
              14       8.00       17.00       12.50     F
              15      17.00       14.00       15.50     F

       MEANS          13.50       14.13
 TOTAL MEANS          12.67       12.93       12.80
                                GROUP
               SOURCE         SS          DF          MS
               GROUP          0.53         1          0.53
               SUBJECT      305.80        14         21.84
               ERROR        214.47        14         15.32
               TOTAL        520.80        29
               GROUP F        0.03      DF =  1,14
               SUBJECT F      1.43      DF = 14,14

               LE>VS EE  NOT SIGNIFICANT AT .05 LEVEL

                             BOYS                               GIRLS
 SOURCE          SS          DF          MS          SS          DF          MS
 GROUP          1.33          1          1.33        3.56         1          3.56
 SUBJECT       67.00          5         13.40       82.00         8         10.25
.ERROR         93.67          5         18.73      116.44         8         14.56
 TOTAL        162.00         11                    202.00        17
 GROUP F        0.07       DF =  1, 5              0.24       DF =  1, 8
 SUBJECT F      0.72       DF =  5, 5              0.70       DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   LE>VS EE NOT SIGNIFICANT AT .05 LEVEL
**********************************************************************
```

```
                                TABLE 59

     FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                      UNDER GROUPS OF SCORES OF:

************************************************************************
                             (PERCENTILE)
     57.  MYKLEBUST PICTURE STORY LANGUAGE TEST (ABSTACT-CONCRETE).
------------------------------------------------------------------------

                         EE           LE           XBAR    SEX

                 1      70.00        50.00        60.00     M
                 2      60.00        90.00        75.00     F
                 3      98.00        35.00        66.50     F
                 4      40.00        30.00        35.00     M
                 5      10.00        70.00        40.00     F
                 6      90.00        50.00        70.00     F
                 7      25.00        30.00        27.50     M

          MEANS         56.14        50.71

                 8       5.00         5.00         5.00     M
                 9      15.00        90.00        52.50     M
                10,     90.00        70.00        80.00     F
                11      98.00        95.00        96.50     F
                12      90.00         5.00        47.50     M
                13      90.00        98.00        94.00     F
                14      90.00        80.00        85.00     F
                15      98.00        40.00        69.00     F

          MEANS         72.00        60.38
    TOTAL MEANS         64.60        55.87        60.23
                                 GROUP
                SOURCE          'SS         DF          MS
                GROUP         572.03         1        572.03
                SUBJECT     18558.87        14       1325.63
                ERROR       13118.47        14        937.03
                TOTAL       32249.37        29
                GROUP F         0.61      DF =  1,14
                SUBJECT F       1.41      DF = 14,14

                EE>VS LE  NOT SIGNIFICANT AT .05 LEVEL

                          BOYS                              GIRLS
  SOURCE            SS          DF         MS          SS        DF          MS
  GROUP         102.08           1     102.08      512.00         1      512.00
  SUBJECT      3985.42           5     797.08     4612.78         8      576.60
  ERROR        6585.42           5    1317.08     6491.00         8      811.37
  TOTAL       10672.92          11               11615.78        17
  GROUP F         0.08      DF =  1, 5               0.63     DF =  1, 8
  SUBJECT F       0.61      DF =  5, 5               0.71     DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
************************************************************************
```

TABLE 60

```
         FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE WITH SUBJECTS NESTED
                         UNDER GROUPS OF SCORES OF:

=================================================================
                              (STANINE)
     58.  MYKLEBUST PICTURE STORY LANGUAGE TEST (ABSTACT-CONCRETE).
-----------------------------------------------------------------

                           EE          LE          XBAR   SEX

                   1       6.00        5.00        5.50    M
                   2       6.00        8.00        7.00    F
                   3       9.00        5.00        7.00    F
                   4       4.00        4.00        4.00    M
                   5       3.00        6.00        4.50    F
                   6       9.00        5.00        7.00    F
                   7       4.00        4.00        4.00    M

          MEANS            5.86        5.29

                   8       2.00        2.00        2.00    M
                   9       3.00        8.00        5.50    M
                  10       8.00        6.00        7.00    F
                  11       9.00        8.00        8.50    F
                  12       8.00        2.00        5.00    M
                  13       8.00        9.00        8.50    F
                  14       8.00        6.00        7.00    F
                  15       9.00        4.00        6.50    F

          MEANS            6.88        5.63
    TOTAL MEANS            6.40        5.47        5.93
                                  GROUP
                SOURCE          SS          DF          MS
                GROUP          6.53          1         6.53
                SUBJECT       90.87         14         6.49
                ERROR         64.47         14         4.60
                TOTAL        161.87         29
                GROUP F        1.42       DF =  1,14
                SUBJECT F      1.41       DF = 14,14

                EE>VS LE  NOT SIGNIFICANT AT .05 LEVEL

                           BOYS                                GIRLS
 SOURCE          SS         DF          MS          SS          DF          MS
 GROUP          0.33         1         0.33        8.00          1         8.00
 SUBJECT       17.67         5         3.53       22.00          8         2.75
 ERROR         30.67         5         6.13       32.00          8         4.00
 TOTAL         48.67        11                    62.00         17
 GROUP F        0.05        DF =  1, 5             2.00        DF =  1, 8
 SUBJECT F      0.58        DF =  5, 5             0.69        DF =  8, 8

EE>VS LE NOT SIGNIFICANT AT .05 LEVEL   EE>VS LE NOT SIGNIFICANT AT .05 LEVEL
=================================================================
```

TABLE 61

COMPARISON OF TWO GROUPS
FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE OF SCORES OF

59. GRAND TOTAL RANK ORDER SCORES OF
ALL LINGUISTIC VARIABLES EXAMINED.

VARIABLE NUMBER	EE	LE
2	5.00	1.00
3	5.00	1.00
7	5.00	1.00
8	5.00	1.00
9	5.00	1.00
10	5.00	1.00
11	5.00	1.00
12	5.00	1.00
13	5.00	1.00
14	5.00	1.00
15	5.00	1.00
16	5.00	1.00
17	5.00	1.00
18	5.00	1.00
19	5.00	1.00
20	5.00	1.00
21	5.00	1.00
22	5.00	1.00
23	5.00	1.00
24	5.00	1.00
25	5.00	1.00
26	5.00	1.00
27	5.00	1.00
28	5.00	1.00
29	5.00	1.00
30	5.00	1.00
31	5.00	1.00
32	5.00	1.00
33	5.00	1.00
34	5.00	1.00
35	5.00	1.00
36	5.00	1.00
37	5.00	1.00
38	5.00	1.00
39	5.00	1.00
41	5.00	1.00
44	5.00	1.00
45	1.00	5.00
46	5.00	1.00
47	5.00	1.00
48	5.00	1.00
49	5.00	1.00
50	5.00	1.00
51	5.00	1.00
52	5.00	1.00
53	5.00	1.00
54	5.00	1.00
55	5.00	1.00
56	5.00	1.00
57	1.00	5.00
58	1.00	5.00

```
                        TABLE 61 (CONT'D)


NOTE: CODE FOR LINGUISTIC VARIABLESRANK: 1.0=HIGH; 5.0=LOW; 2.5=TIE


                  MEAN           VAR            SD            N


        1. EE       4.765       0.90353       0.95054        51
        2. LE       1.235       0.90353       0.95054        51
                SUM OF X        SUM OF X SQ            N

        1. EE     243.00            1203.00           51
        2. LE      63.00             123.00           51
        SOURCE    SUM OF SQUARES       DF      MEAN SQUARE

        BETWEEN          317.65         1     317.65
        WITHIN            90.35       100       0.90
        TOTAL            408.00       101
        F=               351.56
        LE>VS. EE SIGNIFICANT AT .05 LEVEL
==============================================================
```

APPENDIX 4. STATISTICAL TABLES OF LINGUISTIC VARIABLES: VOWEL PRODUCTION RATINGS

```
                                 TABLE 62

             FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
                   TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
            NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.
==========================================================================
                      1. FOR JOE (O) RATER NOS. 1 TO 12.
--------------------------------------------------------------------------
                           (WITH EXPERIENCE)                          (WITHOUT EXPERIENCE)
                 RATER RATER RATER RATER RATER RATER RATER      RATER RATER RATER RATER RATER
                   01    02    03    04    05    06    07         08    09    10    11    12

        1   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        2   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        3   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        4   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        5   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        6   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        7   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00

MEANS             3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00

        8   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        9   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       10   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  2.50  3.00  3.00
       11   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       12   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       13   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       14   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       15   EE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00

MEANS             3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  2.94  3.00  3.00
TOTAL MEANS       3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  2.97  3.00  3.00

        1   LE    3.00  3.00  3.00  3.00  3.00  2.50  3.00       3.00  3.00  3.00  3.00  3.00
        2   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        3   LE    3.00  3.00  3.00  3.00  3.00  3.00  2.50       3.00  3.00  3.00  3.00  3.00
        4   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        5   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        6   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        7   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00

MEANS             3.00  3.00  3.00  3.00  3.00  2.93  2.93       3.00  3.00  3.00  3.00  3.00

        8   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
        9   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       2.00  3.00  3.00  3.00  3.00
       10   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       11   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       12   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       13   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       14   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00
       15   LE    3.00  3.00  3.00  3.00  3.00  3.00  3.00       3.00  3.00  3.00  3.00  3.00

MEANS             3.00  3.00  3.00  3.00  3.00  3.00  3.00       2.88  3.00  3.00  3.00  3.00
TOTAL MEANS       3.00  3.00  3.00  3.00  3.00  2.97  2.97       2.93  3.00  3.00  3.00  3.00
```

```
                         TABLE 62 (CONT'D)

                                      EE                LE                XBAR
     W/  EDUCATIONAL EXPERIENCE      3,000             2.990             2.995
     W/O EDUCATIONAL EXPERIENCE      2.993             2.987             2.990
                           MEAN      2.997             2.989             2.993


                      1. FOR JOE (O) RATER NOS. 1 TO 12.

SOURCE                                         SS         DF        MS          F


SS RATER                                     0.041        11      0.004       0,758
  SS EXPERIENCE OF RATER                     0.002         1      0.002       0,491
  SS RATER EFFECT NOT DUE TO EXPERIENCE      0.039        10      0.004       0.785
  RATER EFFECTS              (VARIANCE EXPLAINED)                   (     PER CENT)

SS SUBJECTS                                  0.128        29      0.004       0.901
  SS GROUPS OF SUBJECTS                      0.006         1      0.006       1.273
  SS SUBJECT EFFECT NOT DUE TO GROUPS        0.122        28      0.004       0.886

SS EXPERIENCE OF RATER X GROUPS              0.000         1      0.000       0.031

SS ERROR                                     1.563       318      0.005

SS TOTAL                                     1.733       359


RATER F         .758      DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F        1.273      DF =  1,318  EE>VS. LE            NOT SIGNIFICANT AT .25 LEVEL
SUBJECT F       .901      DF = 29,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
=================================================================================================
```

TABLE 63

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

2. FOR TOOK (U) RATERS NOS. 1 TO 12. /u/.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	2.86	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
10	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.88	3.00	3.00
TOTAL MEANS		3.00	3.00	3.00	3.00	3.00	3.00	2.93	3.00	3.00	2.93	3.00	3.00
1	LE	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	2.93	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.94	2.88	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	2.97	3.00	3.00	3.00	3.00	2.97	2.93	3.00	3.00	3.00

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                              TABLE 63 (CONT'D)

                                         EE             LE              XBAR
W/  EDUCATIONAL EXPERIENCE             2.990          2.995            2.993
W/O EDUCATIONAL EXPERIENCE             2.987          2.980            2.983
                      MEAN             2.989          2.989            2.989

                   2. FOR TOOK (U) RATERS NOS. 1 TO 12./ u /.


SOURCE                                              SS        DF        MS          F

SS RATER                                          0.072       11      0.007       0.781
  SS EXPERIENCE OF RATER                          0.028        1      0.008       0.947
  SS RATER EFFECT NOT DUE TO EXPERIENCE           0.064       10      0.006       0.765
  RATER EFFECTS              (VARIANCE EXPLAINED)                      (       PER CENT)

SS SUBJECTS                                       0.206       29      0.007       0.843
  SS GROUPS OF SUBJECTS                           0.000        1      0.000       0.000
  SS SUBJECT EFFECT NOT DUE TO GROUPS             0.206       28      0.007       0.873

SS EXPERIENCE OF RATER X GROUPS                   0.003        1      0.003       0.337

SS ERROR                                          2.675      318      0.008

SS TOTAL                                          2.956      359

RATER F        .781     DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F        .000     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F      .843     DF = 29,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
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TABLE 64

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

3. FOR FATHERS (a) RATERS NOS. 1 TO 12.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
2	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
3	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
4	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
5	EE	3.[illegible]	2.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]
6	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
7	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
MEANS		3.[illegible]	2.86	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
8	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
9	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
10	EE	3.[illegible]	3.[illegible]	2.50	3.[illegible]	3.[illegible]	2.5[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
11	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]
12	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
13	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
14	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
15	EE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
MEANS		3.[illegible]	3.[illegible]	2.94	3.[illegible]	3.[illegible]	2.94	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
TOTAL MEANS		3.[illegible]	2.93	2.97	3.[illegible]	3.[illegible]	2.97	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
1	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
2	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
3	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
4	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
5	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
6	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]
7	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
MEANS		3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
8	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
9	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	2.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
10	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
11	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]	[illegible]
12	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	[illegible]
13	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	2.5[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
14	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]
15	LE	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	2.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]
MEANS		3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	2.69	3.[illegible]	3.[illegible]	3.[illegible]	[illegible]
TOTAL MEANS		3.03	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	3.[illegible]	2.83	3.[illegible]	3.[illegible]	[illegible]	3.[illegible]

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                              TABLE 64 (CONT'D)

                                        EE                LE                XBAR
      W/  EDUCATIONAL EXPERIENCE       2.981             3.000             2.990
      W/O EDUCATIONAL EXPERIENCE       3.000             2.967             2.983
                            MEAN       2.989             2.986             2.988

                    3. FOR FATHERS ( Q ) RATERS NOS. 1 TO 12.

   SOURCE                                          SS        DF        MS          F

   SS RATER                                      0.202       11      0.018       1.865
     SS EXPERIENCE OF RATER                      0.004        1      0.004       0.455
     SS RATER EFFECT NOT DUE TO EXPERIENCE       0.198       10      0.020       2.026
     RATER EFFECTS              (VARIANCE EXPLAINED)                   (    PER CENT)

   SS SUBJECTS                                   0.298       29      0.010       1.043
     SS GROUPS OF SUBJECTS                       0.001        1      0.001       0.271
     SS SUBJECT EFFECT NOT DUE TO GROUPS         0.297       28      0.011       1.077


   SS EXPERIENCE OF RATER X GROUPS               0.060        1      0.060       6.092

   SS ERROR                                      3.134      318      0.010



   SS TOTAL                                      3.694      359

   RATER F        1.865     DF = 11,318  W/ EXP>VS. W/OEXP     SIGNIFICANT AT .05 LEVEL
   GROUP F         .071     DF =  1,318  EE>VS. LE             NOT SIGNIFICANT AT .05 LEVEL
   SUBJECT F      1.043     DF = 29,318  EE>VS. LE             NOT SIGNIFICANT AT .05 LEVEL
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TABLE 65

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

4. FOR SHOE (U) RATER NOS. 1 TO 12.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER R1	RATER R2	RATER R3	RATER R4	RATER R5	RATER R6	RATER R7	RATER R8	RATER R9	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	2.94	3.00	2.88	3.00	3.00	3.00	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	2.97	3.00	2.93	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.81	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.90	3.00	3.00	3.00	3.00

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                         TABLE 65 (CONT'D)

                                      EE                LE                XBAR
   W/  EDUCATIONAL EXPERIENCE        2.986             3.000             2.993
   W/O EDUCATIONAL EXPERIENCE        3.000             2.980             2.990
                         MEAN        2.992             2.992             2.992

                  4. FOR SHOE (U) RATER NOS. 1 TO 12.

SOURCE                                         SS         DF        MS          F

SS RATER                                      0.092       11      0.008       1.220
  SS EXPERIENCE OF RATER                      0.001        1      0.001       0.137
  SS RATER EFFECT NOT DUE TO EXPERIENCE       0.091       10      0.009       1.331
  RATER EFFECTS           (VARIANCE EXPLAINED)                      (    PER CENT)

SS SUBJECTS                                   0.183       29      0.006       0.925
  SS GROUPS OF SUBJECTS                       0.000        1      0.000       0.003
  SS SUBJECT EFFECT NOT DUE TO GROUPS         0.183       28      0.007       0.958

SS EXPERIENCE OF RATER X GROUPS               0.026        1      0.026       3.763

SS ERROR                                      2.174      318      0.007

SS TOTAL                                      2.475      359

RATER F        1.220     DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F         .000     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F       .925     DF = 29,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
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                                      TABLE 66

              FINDINGS OF TWO--WAY ANALYSIS OF VARIANCE OF SCORES OF
                    TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
            NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.
================================================================================================
                        5. FOR BEACH (E) RATER NOS. 1 TO 12.
------------------------------------------------------------------------------------------------
                                (WITH EXPERIENCE)                             (WITHOUT EXPERIENCE)
                  RATER RATER RATER RATER RATER RATER RATER         RATER RATER RATER RATER RATER
                   01    02    03    04    05    06    07            08    09    10    11    12

         1   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  2.00  3.00  3.00  3.00
         2   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         3   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         4   EE   3.00  3.00  3.00  2.50  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         5   EE   2.50  2.00  2.00  2.00  2.00  2.00  2.00          3.00  2.00  2.50  2.00  2.00
         6   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         7   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
MEANS             2.93  2.86  2.86  2.79  2.86  2.86  2.86          3.00  2.71  2.93  2.86  2.86

         8   EE   3.00  3.00  3.00  2.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         9   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
        10   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
        11   EE   3.00  3.00  3.00  2.00  3.00  2.00  3.00          2.00  3.00  3.00  3.00  3.00
        12   EE   3.00  3.00  3.00  2.00  3.00  2.00  3.00          3.00  3.00  3.00  3.00  3.00
        13   EE   3.00  3.00  3.00  2.00  3.00  2.00  3.00          3.00  3.00  3.00  3.00  3.00
        14   EE   3.00  3.00  3.00  3.00  3.00  2.00  3.00          3.00  3.00  3.00  3.00  2.00
        15   EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
MEANS             3.00  3.00  3.00  2.50  3.00  2.50  3.00          2.88  3.00  3.00  3.00  2.88
TOTAL MEANS       2.97  2.93  2.93  2.63  2.93  2.67  2.93          2.93  2.87  2.97  2.93  2.87

         1   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         2   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         3   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         4   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         5   LE   2.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         6   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          2.00  3.00  2.50  3.00  3.00
         7   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
MEANS             2.86  3.00  3.00  3.00  3.00  3.00  3.00          2.86  3.00  2.93  3.00  3.00

         8   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
         9   LE   3.00  3.00  3.00  2.00  3.00  2.00  3.00          2.00  3.00  3.00  3.00  3.00
        10   LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00          3.00  3.00  3.00  3.00  3.00
        11   LE   3.00  3.00  3.00  2.00  3.00  2.00  3.00          3.00  3.00  2.50  3.00  3.00
        12   LE   3.00  3.00  2.50  3.00  3.00  2.50  3.00          3.00  3.00  3.00  3.00  3.00
        13   LE   3.00  3.00  2.50  3.00  3.00  2.50  3.00          2.50  3.00  3.00  3.00  3.00
        14   LE   3.00  3.00  3.00  2.00  2.00  2.00  3.00          3.00  3.00  3.00  3.00  3.00
        15   LE   3.00  3.00  3.00  2.50  3.00  2.50  3.00          2.00  3.00  3.00  3.00  3.00
MEANS             3.00  3.00  2.88  2.56  2.88  2.44  3.00          2.69  3.00  2.94  3.00  3.00
TOTAL MEANS       2.93  3.00  2.93  2.77  2.93  2.70  3.00          2.77  3.00  2.93  3.00  3.00
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                             TABLE 66 (CONT'D)

                                     EF                 LE                  XPAR
   W/  EDUCATIONAL EXPERIENCE       2.857              2.895               2.876
   W/O EDUCATIONAL EXPERIENCE       2.913              2.940               2.927
                         MEAN       2.881              2.914               2.897


                     5. FOR BENCH (E) RATER NOS. 1 TO 12.

SOURCE                                        SS         DF        MS          F

SS RATER                                    3.364        11      0.306       5.621
  SS EXPERIENCE OF RATER                    0.223         1      0.223       4.098
  SS RATER EFFECT NOT DUE TO EXPERIENCE     3.141        10      0.314       5.774
  RATER EFFECTS            (VARIANCE EXPLAINED)                  (      PER CENT)

SS SUBJECTS                                 9.531        29      0.329       6.041
  SS GROUPS OF SUBJECTS                     0.100         1      0.100       1.838
  SS SUBJECT EFFECT NOT DUE TO GROUPS       9.431        28      0.337       6.191

SS EXPERIENCE OF RATER X GROUPS             0.003         1      0.003       0.052

SS ERROR                                   17.300       318      0.054

SS TOTAL                                   30.197       359

RATER F         5.621     DF = 11,318  W/OEXP>VS. W/ EXP    SIGNIFICANT AT .05 LEVEL
GROUP F         1.838     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F       6.041     DF = 29,318  LE>VS. EE            SIGNIFICANT AT .05 LEVEL
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TABLE 67

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

6. FOR OUT (AU) RATER NOS. 1 TO 12./ a /.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	EE	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	2.00	2.00	3.00
15	EE	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	2.88	3.00	3.00	2.88	3.00	3.00	2.88	2.88	3.00
TOTAL MEANS		3.00	3.00	3.00	2.93	3.00	3.00	2.93	3.00	3.00	2.93	2.93	3.00
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	2.93	3.00	2.93	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	2.94	2.81	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	2.97	3.00	2.97	3.00	2.97	2.90	3.00	3.00	3.00	3.00

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                              TABLE 67 (CONT'D)

                                     EE                 LE                   XBAR
     W/  EDUCATIONAL EXPERIENCE     2.981              2.986                2.983
     W/O EDUCATIONAL EXPERIENCE     2.973              2.980                2.977
                           MEAN     2.976              2.983                2.981

                    6. FOR OUT (AU) RATER NOS. 1 TO 12. / a  /.

SOURCE                                          SS          DF        MS            F

SS RATER                                       0.131        11       0.012         0.856
  SS EXPERIENCE OF RATER                       0.004         1       0.004         0.282
  SS RATER EFFECT NOT DUE TO EXPERIENCE        0.127        10       0.013         0.913
  RATER EFFECTS              (VARIANCE EXPLAINED)                        (    PER CENT)

SS SUBJECTS                                    0.822        29       0.028         2.044
  SS GROUPS OF SUBJECTS                        0.003         1       0.003         0.220
  SS SUBJECT EFFECT NOT DUE TO GROUPS          0.819        28       0.029         2.110


SS EXPERIENCE OF RATER X GROUPS                0.000         1       0.000         0.004

SS ERROR                                       4.411       318       0.014

SS TOTAL                                       5.364       359

RATER F          .856     DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F          .220     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F       2.044     DF = 29,318  LE>VS. EE            SIGNIFICANT AT .05 LEVEL
=========================================================================================
                                         TABLE 68

                   FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
                         TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
                 NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.
                 ===========================================================================
=======================================7. FOR AND (=) RATER NOS. 1 TO 12.
-----------------------------------------------------------------------------------------------
                                                                     (WITHOUT EXPERIENCE)
                          (WITH EXPERIENCE)                      RATER RATER RATER RATER RATER
             RATER RATER RATER RATER RATER RATER RATER             08    09    10    11    12
              01    02    03    04    05    06    07

     1  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     2  EE   3.00  3.00  3.00  3.00  2.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     3  EE   3.00  3.00  3.00  3.00  2.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     4  EE   2.00  3.00  3.00  2.50  2.00  2.00  3.00            3.00  3.00  3.00  3.00  3.00
     5  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     6  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     7  EE   3.00  3.00  3.00  3.00  2.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00

MEANS        2.86  3.00  3.00  2.93  2.43  2.86  3.00            3.00  3.00  3.00  3.00  3.00

     8  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     9  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    10  EE   3.00  2.50  3.00  2.50  2.50  2.50  3.00            3.00  3.00  3.00  3.00  3.00
    11  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    12  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    13  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    14  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    15  EE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00

MEANS        3.00  2.94  3.00  2.94  2.94  2.94  3.00            3.00  3.00  3.00  3.00  3.00
TOTAL MEANS  2.93  2.97  3.00  2.93  2.70  2.90  3.00            3.00  3.00  3.00  3.00  3.00

     1  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     2  LE   2.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     3  LE   3.00  3.00  3.00  3.00  2.50  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     4  LE   3.00  3.00  3.00  3.00  2.50  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     5  LE   2.00  3.00  3.00  3.00  3.00  2.00  3.00            3.00  3.00  3.00  3.00  3.00
     6  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
     7  LE   3.00  3.00  2.50  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00

MEANS        2.71  3.00  2.93  3.00  2.86  2.86  3.00            3.00  3.00  3.00  3.00  3.00

     8  LE   3.00  3.00  2.00  3.00  2.00  2.00  3.00            3.00  3.00  3.00  3.00  3.00
     9  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    10  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    11  LE   3.00  3.00  3.00  3.00  2.00  3.00  3.00            3.00  3.00  2.50  3.00  3.00
    12  LE   2.00  3.00  3.00  3.00  2.00  2.00  3.00            3.00  3.00  3.00  3.00  3.00
    13  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            2.50  3.00  3.00  3.00  3.00
    14  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00
    15  LE   3.00  3.00  3.00  3.00  3.00  3.00  3.00            3.00  3.00  3.00  3.00  3.00

MEANS        2.88  3.00  2.88  3.00  2.63  2.75  3.00            2.94  3.00  2.94  3.00  3.00
TOTAL MEANS  2.80  3.00  2.90  3.00  2.73  2.80  3.00            2.97  3.00  2.97  3.00  3.00
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                              TABLE 6A (CONT'D)

                                     EE                  LE                   XBAR
W/  EDUCATIONAL EXPERIENCE          2.919               2.890                2.905
W/O EDUCATIONAL EXPERIENCE          3.000               2.987                2.993
                      MEAN          2.953               2.931                2.942

                   7. FOR AND (=) RATER NOS. 1 TO 12.

SOURCE                                         SS        DF         MS          F

SS RATER                                     2.525       11       0.230       5.994
  SS EXPERIENCE OF RATER                     0.686        1       0.686      17.924
  SS RATER EFFECT NOT DUE TO EXPERIENCE      1.839       10       0.184       4.801
  RATER EFFECTS                (VARIANCE EXPLAINED)                 (    PER CENT)

SS SUBJECTS                                  2.567       29       0.089       2.311
  SS GROUPS OF SUBJECTS                      0.044        1       0.044       1.160
  SS SUBJECT EFFECT NOT DUE TO GROUPS        2.522       28       0.090       2.352


SS EXPERIENCE OF RATER X GROUPS              0.005        1       0.005       0.133

SS ERROR                                    12.178      318       0.038



SS TOTAL                                    17.275      359

RATER F        5.994    DF = 11,318  W/OEXP>VS. W/ EXP    SIGNIFICANT AT .05 LEVEL
GROUP F        1.160    DF =  1,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F      2.311    DF = 29,318  EE>VS. LE            SIGNIFICANT AT .05 LEVEL
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TABLE 69

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

8. FOR LAID (EI) RATER NOS. 1 TO 12./ o /

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	2.93	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	2.97	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.81	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.90	3.00	3.00	3.00	3.00

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                                TABLE 69 (CONT'D)

                                      EE                  LE                  XBAR
   W/  EDUCATIONAL EXPERIENCE       2.995               3.000               2.998
   W/O EDUCATIONAL EXPERIENCE       3.000               2.980               2.992
                         MEAN       2.997               2.992               2.994

                     8. FOR LAID (EI) RATER NOS. 1 TO 12. / @   /.


SOURCE                                              SS          DF          MS            F

SS RATER                                         0.072          11       0.007        1.620
  SS EXPERIENCE OF RATER                         0.005           1       0.005        1.257
  SS RATER EFFECT NOT DUE TO EXPERIENCE          0.067          10       0.007        1.657
  RATER EFFECTS              (VARIANCE EXPLAINED)                       (    PER CENT)

SS SUBJECTS                                      0.114          29       0.004        0,969
  SS GROUPS OF SUBJECTS                          0.003           1       0.003        0,685
  SS SUBJECT EFFECT NOT DUE TO GROUPS            0.111          28       0.004        0.979

SS EXPERIENCE OF RATER X GROUPS                  0.013           1       0.013        3.304


SS ERROR                                         1.289         318       0.004

SS TOTAL                                         1,489         359

RATER F        1.620     DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F         .685     DF =  1,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F       .969     DF = 29,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
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                                         TABLE 70

                   FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
                        TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
                 NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.
===============================================================================
                          9. FOR IT (I) RATER NOS. 1 TO 12.
-------------------------------------------------------------------------------
                     (WITH EXPERIENCE)                        (WITHOUT EXPERIENCE)
          RATER RATER RATER RATER RATER RATER RATER    RATER RATER RATER RATER RATER
            01    02    03    04    05    06    07      08    09    10    11    12

    1  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    2  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    3  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    4  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    5  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    6  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    7  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
MEANS
           3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    8  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    9  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   10  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   11  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   12  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   13  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   14  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   15  EE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
MEANS      3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
TOTAL MEANS
           3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    1  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    2  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    3  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    4  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    5  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    6  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    7  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
MEANS
           3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    8  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
    9  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   10  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   11  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   12  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   13  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   14  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    3.00  3.00  3.00  3.00  3.00
   15  LE  3.00  3.00  3.00  3.00  3.00  3.00  3.00    2.00  3.00  3.00  3.00  3.00
MEANS      3.00  3.00  3.00  3.00  3.00  3.00  3.00    2.88  3.00  3.00  3.00  3.00
TOTAL MEANS
           3.00  3.00  3.00  3.00  3.00  3.00  3.00    2.93  3.00  3.00  3.00  3.00
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                            TABLE 70 (CONT'D)

                                         EE              LE              XBAR
      W/  EDUCATIONAL EXPERIENCE       3.000           3.000           3.000
      W/O EDUCATIONAL EXPERIENCE       3.000           2.987           2.993
                                MEAN   3.000           2.994           2.997

                        9. FOR IT (I ) RATER NOS. 1 TO 12.

SOURCE                                         SS        DF        MS          F

SS RATER                                     0.031       11      0.003      1.002
  SS EXPERIENCE OF RATER                     0.004        1      0.004      1.428
  SS RATER EFFECT NOT DUE TO EXPERIENCE      0.027       10      0.003      0.961
  RATER EFFECTS             (VARIANCE EXPLAINED)                   (   PER CENT)

SS SUBJECTS                                  0.081       29      0.003      1.001
  SS GROUPS OF SUBJECTS                      0.003        1      0.003      1.001
  SS SUBJECT EFFECT NOT DUE TO GROUPS        0.078       28      0.003      1.001

SS EXPERIENCE OF RATER X GROUPS              0.004        1      0.004      1.397

SS ERROR                                     0.882      318      0.003


SS TOTAL                                     0.997      359


RATER F        1.002    DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F        1.001    DF =  1,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F      1.001    DF = 29,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
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TABLE 71

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF
TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH
NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

10. FOR THE (5) RATER NOS. 1 TO 12.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	EE	2.00	3.00	3.00	3.00	2.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	EE	3.00	3.00	2.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	3.00	[illegible]	[illegible]	[illegible]
MEANS		2.86	3.00	2.86	3.00	2.86	3.00	3.00	[illegible]	3.00	[illegible]	[illegible]	[illegible]
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	2.50	2.50	[illegible]	[illegible]	[illegible]	[illegible]
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	2.94	2.94	3.00	[illegible]	[illegible]	[illegible]
TOTAL MEANS		2.93	3.00	2.93	3.00	2.93	3.00	2.97	2.77	[illegible]	[illegible]	[illegible]	[illegible]
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	LE	3.00	3.00	2.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MEANS		3.00	3.00	2.86	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	[illegible]	[illegible]	[illegible]	[illegible]
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	[illegible]	[illegible]	[illegible]	[illegible]
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.81	3.00	[illegible]	[illegible]	[illegible]
TOTAL MEANS		3.00	3.00	2.93	3.00	3.00	3.00	3.00	2.90	3.00	[illegible]	[illegible]	[illegible]

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                          TABLE 71 (CONT'D)

                                        EE                LE                XBAR
   W/  EDUCATIONAL EXPERIENCE         2,967             2.990              2.979
   W/O EDUCATIONAL EXPERIENCE         2,993             2.980              2.987
                         MEAN         2.978             2.986              2.982


                    10. FOR THE ( a ) RATER NOS. 1 TO 12.

SOURCE                                        SS        DF        MS           F


SS RATER                                    0.224       11      0.020        1.349
  SS EXPERIENCE OF RATER                    0.006        1      0.006        0.379
  SS RATER EFFECT NOT DUE TO EXPERIENCE     0.219       10      0.022        1.446
  RATER EFFECTS               (VARIANCE EXPLAINED)     .            (   PER CENT)

SS SUBJECTS                                 0.570       29      0.020        1.320
  SS GROUPS OF SUBJECTS                     0.006        1      0.006        0.414
  SS SUBJECT EFFECT NOT DUE TO GROUPS       0.564       28      0.020        1.332


SS EXPERIENCE OF RATER X GROUPS             0.030        1      0.030        1.994

SS ERROR                                    4.808      318      0.015


SS TOTAL                                    5.633      359

RATER F         1.349     DF = 11,318  W/OEXP>VS. W/ EXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F          .414     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F       1.300     DF = 29,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
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TABLE 72

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

II. FOR LAWN (ɔ) RATER NOS. 1 TO 12.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	EE	3.00	2.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	2.00	3.00	3.00	3.00	2.50	2.50	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	2.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	2.63	2.94	2.88	3.00	2.81	2.94	3.00	3.00	3.00	3.00	3.00
TOTAL MEANS		3.00	2.80	2.97	2.93	3.00	2.90	2.97	3.00	3.00	3.00	3.00	3.00
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	LE	3.00	2.50	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
MEANS		3.00	2.94	3.00	2.94	3.00	3.00	3.00	2.81	3.00	2.88	3.00	3.00
TOTAL MEANS		3.00	2.97	3.00	2.97	3.00	3.00	3.00	2.90	3.00	2.93	3.00	3.00

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                         TABLE 72 (CONT'D)

                                         EE             LE                 XBAR
       W/  EDUCATIONAL EXPERIENCE      2.938          2.990               2.964
       W/O EDUCATIONAL EXPERIENCE      3.003          2.963               2.983
                             MEAN      2.964          2.981               2.972


                 .11. FOR LAWN (D) RATER NOS. 1 TO 12.
SOURCE
                                                    SS        DF        MS             F

SS RATER
  SS EXPERIENCE OF RATER                          0.406       11      0.037          1,776
  SS RATER EFFECT NOT DUE TO EXPERIENCE           0.032        1      0.032          1,531
  RATER EFFECTS                                   0.374       10      0.037          1.031
                          (VARIANCE EXPLAINED)                          (      PER CENT)
SS SUBJECTS
  SS GROUPS OF SUBJECTS                           1.056       29      0.036          1.754
  SS SUBJECT EFFECT NOT DUE TO GROUPS             0.025        1      0.025          1.226
                                                  1.031       28      0.037          1.773

SS EXPERIENCE OF RATER X GROUPS                   0.161        1      0.161          7.743

SS ERROR
                                                  6.608      318      0.021
SS TOTAL
                                                  8.222      359

RATER F          1.776     DF = 11,318  W/OEXP>VS. W/ EXP    SIGNIFICANT AT .05 LEVEL
GROUP F          1.226     DF =  1,318  LE>VS. EE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F        1.754     DF = 29,318  LE>VS. EE            SIGNIFICANT AT .05 LEVEL
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TABLE 73

FINDINGS OF TWO-WAY ANALYSIS OF VARIANCE OF SCORES OF TOTAL RATINGS OF VOWELS OF EACH SUBJECT WITH NESTING OF SUBJECTS UNDER GROUPS AND RATERS UNDER EXPERIENCE.

12. FOR FATHERS (♂) RATER NOS. 1 TO 12.

		(WITH EXPERIENCE)							(WITHOUT EXPERIENCE)				
		RATER 01	RATER 02	RATER 03	RATER 04	RATER 05	RATER 06	RATER 07	RATER 08	RATER 09	RATER 10	RATER 11	RATER 12
1	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	EE	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
15	EE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	2.94	3.00	3.00	3.00	3.00	3.00	2.88	3.00	3.00
TOTAL MEANS		3.00	3.00	3.00	2.97	3.00	3.00	3.00	3.00	3.00	2.93	3.00	3.00
1	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
4	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
7	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
MEANS		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
8	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
10	LE	2.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00
11	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
13	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00	3.00	3.00
14	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	LE	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
MEANS		2.88	3.00	3.00	3.00	3.00	2.88	3.00	2.81	3.00	3.00	3.00	3.00
TOTAL MEANS		2.93	3.00	3.00	3.00	3.00	2.93	3.00	2.90	3.00	3.00	3.00	3.00

TABLE 73 (CONT'D)

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                                      EE              LE              XBAR
W/  EDUCATIONAL EXPERIENCE          2.995           2.981           2.988
W/O EDUCATIONAL EXPERIENCE          2.987           2.980           2.983
                      MEAN          2.992           2.981           2.986


                    12. FOR FATHERS (♂) RATER NOS. 1 TO 12.


SOURCE                                         SS         DF        MS           F

SS RATER                                     0.114        11      0.010        0.857
  SS EXPERIENCE OF RATER                     0.002         1      0.002        0.164
  SS RATER EFFECT NOT DUE TO EXPERIENCE      0.112        10      0.011        0.926
  RATER EFFECTS             (VARIANCE EXPLAINED)                  (     PER CENT)

SS SUBJECTS                                  0.472        29      0.016        1,347
  SS GROUPS OF SUBJECTS                      0.011         1      0.011        0.919
  SS SUBJECT EFFECT NOT DUE TO GROUPS        0.461        28      0.016        1.363

SS EXPERIENCE OF RATER X GROUPS              0.001         1      0.001        0.106


SS ERROR                                     3.843       318      0.012

SS TOTAL                                     4.431       359

RATER F         .857    DF = 11,318  W/ EXP>VS. W/OEXP    NOT SIGNIFICANT AT .05 LEVEL
GROUP F         .919    DF =  1,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
SUBJECT F      1,347    DF = 29,318  EE>VS. LE            NOT SIGNIFICANT AT .05 LEVEL
*****************************************************************************************
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TABLE 74

FINDINGS OF ONE-WAY ANALYSIS OF VARIANCE OF RATINGS

FOR THE PRODUCTION OF VOWELS COMPARING
TWO GROUPS LE VS EE

VOWEL OR DIPTHONG	F. RATIO	
	GROUP	SUBJECT
1. / o / (FOR:JOE)	1.273	0.901
2. / u / (FOR:TOOK)	0.000	0.843
3. / ɑ / (FOR:FATHERS)	0.071	1.043
4. / U / (FOR:SHOE)	0.000	0.925
5. / ɛ / (FOR:BENCH)	1.838	6.041
6. / ɑu / (FOR:OUT)	0.200	2.044
7. / æ / (FOR:AND)	1.160	2.311
8. / ei / (FOR:LAID)	0.685	0.969
9. / I / (FOR:IT)	1.001	1.001
10. / ə / (FOR:THE)	0.414	1.300
11. / ɔ / (FOR:LAWN)	1.206	1.754
12. / ɚ / (FOR:FATHERS)	0.919	1.347

** SIGNIFICANT AT .05 LEVEL

TABLE 75

FINDINGS OF FRIEDMAN'S 2-WAY ANALYSIS OF VARIANCE BY RANKS WITH
SUBJECTS NESTED UNDER GROUPS OF SCORES OF

INFLECTION RATER RANKS OF EACH SUBJECT OF 2 GROUPS:EE VS. LE
DATA OF JUDGES RANKED SCORES WITHIN ROWS FOR VARIABILITY.

		(WITH EXPERIENCE)								WITHOUT EXPERIENCE				
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	EE	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
2	EE	2.50	2.50	9.00	2.50	9.00	9.00	9.00	9.00	9.00	9.00	2.50	9.00	9.00
3	EE	2.00	2.00	9.50	9.50	13.00	5.00	9.50	5.00	2.00	5.00	9.50	9.50	9.50
4	EE	2.00	2.00	7.50	2.00	12.50	7.50	7.50	7.50	12.50	7.00	7.50	7.00	7.50
5	EE	4.50	11.00	4.50	4.50	11.00	4.50	4.50	4.50	11.00	4.50	4.50	11.00	11.00
6	EE	1.00	4.00	4.00	10.00	4.00	4.00	10.00	10.00	10.00	6.00	10.00	10.00	10.00
7	EE	8.00	2.50	8.00	2.50	12.50	8.00	8.00	2.50	2.50	12.50	8.00	8.00	8.00
8	EE	2.50	11.00	1.00	5.00	11.00	11.00	5.00	5.00	5.00	11.00	5.00	5.00	11.00
9	EE	4.00	4.00	4.00	12.50	4.00	10.50	10.50	4.00	4.00	10.50	4.00	10.50	11.50
10	EE	6.00	1.00	8.00	8.00	8.00	5.00	8.00	8.00	8.00	12.00	8.00	8.00	8.00
11	EE	5.50	1.50	1.50	6.50	12.00	12.00	6.00	6.50	6.50	12.00	6.50	6.00	6.00
12	EE	1.50	5.00	3.00	10.00	1.50	12.00	5.00	5.00	10.00	13.00	5.00	10.00	10.00
13	EE	13.00	7.00	7.00	7.00	1.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
14	EE	12.50	11.50	8.50	4.50	6.50	10.50	8.50	1.00	10.50	4.50	4.50	10.50	12.00
15	EE	11.50	11.50	5.00	5.00	11.50	5.00	[illegible]	11.50	5.00	5.00	5.00	5.00	6.00
16	LE	12.50	7.50	2.00	2.00	2.00	7.50	[illegible]	7.50	7.50	7.50	7.50	12.50	7.50
17	LE	4.50	12.00	6.50	4.50	4.50	12.00	12.00	1.50	1.50	2.50	8.00	8.00	8.50
18	LE	4.50	4.50	4.50	4.50	4.50	8.50	10.50	4.50	13.00	4.50	10.50	12.50	12.00
19	LE	5.50	2.50	5.50	10.50	5.50	10.50	12.50	5.50	1.00	2.50	10.50	12.00	12.00
20	LE	6.50	6.50	6.50	12.00	6.50	6.50	12.00	1.50	1.50	6.50	6.00	8.00	12.00
21	LE	5.50	5.50	1.50	5.50	5.50	10.50	10.50	1.50	13.00	5.50	5.50	10.50	12.00
22	LE	2.00	8.00	2.00	8.00	13.00	9.00	8.00	2.00	8.00	2.00	8.00	6.00	8.00
23	LE	11.00	2.00	6.00	11.00	6.00	11.00	11.00	6.00	6.00	2.00	11.00	6.00	2.00
24	LE	4.50	8.50	1.50	4.50	4.50	11.00	6.50	1.50	12.50	12.50	4.50	8.50	8.00
25	LE	7.50	1.00	12.50	7.50	2.00	1.50	7.50	2.00	12.50	7.50	7.50	7.50	7.50
26	LE	1.00	5.50	2.00	2.00	2.00	9.50	5.50	5.50	12.50	9.50	9.50	5.50	9.00
27	LE	12.50	2.00	2.00	5.00	2.00	12.50	9.00	9.00	5.00	5.00	9.00	9.00	9.00
28	LE	4.00	4.00	4.00	4.00	4.00	8.50	8.50	1.00	13.00	10.50	6.50	8.50	10.50
29	LE	9.00	3.00	9.00	9.00	9.00	9.00	9.00	1.00	3.00	1.00	9.00	9.00	9.00
30	LE	6.00	6.00	6.00	6.00	6.00	2.00	6.00	1.00	11.50	11.50	11.50	6.00	11.50
		179.00	161.00	159.00	190.50	199.50	249.50	243.00	146.50	231.50	213.00	221.50	251.50	265.50

```
                12
CHI**2 = N*K*(K+1) * SUM(COLUMN TOTALS **2)-3*N*(K+1)

              1
CHI**2 =    455     * 583932,641 **2 - 1260

CHI**2 = 1280,60

WHERE: N = NUMBER OF ROWS
       K = NUMBER OF COLUMNS

W/ EXP>VS. W/O EXP SIGNIFICANT AT .05 LEVEL
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APPENDIX 5. STATISTICAL TABLES OF LINGUISTIC VARIABLES: SUMMARY OF RESULTS

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TABLE 76

COMPARISON OF INDEPENDENT VARIABLES

SUMMARY OF THE GROUPS STUDIED

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP	
MATCHING VARIABLES			
NUMBER OF SUBJECTS	15	15	
NON-LANGUAGE I.Q.	107.1	107.1	
(S.E.S.) SOCIO ECONOMIC STATUS	2.6	2.6	
SEX:			
MALE	6	6	
FEMALE	9	9	
SCHOOL GRADE:			
FOURTH	6	6	
FIFTH	1	1	
SEVENTH	5	5	
EIGHTH	3	3	
OTHER VARIABLES			
(AGE IN MONTHS:)			
CHRONOLOGICAL ENTRY AGE	72.2	85.9	**
PRESENT CHRONOLOGICAL AGE	130.9	144.6	**

** SIGNIFICANT AT .05 LEVEL.

TABLE 77

SUMMARY OF ANALYSIS OF VARIANCE OF CTMM SHORT FORM

TEST OF ACADEMIC APTITUDE

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) EARLY ENTRANTS GROUP
MECHANICS OF ENGLISH:		
GRADE EQUIVALENT	5.4	7.5 **
NATIONAL PERCENTILE	42.7	63.3 **
EXPRESSION OF ENGLISH:		
GRADE EQUIVALENT	5.3	8.7 **
NATIONAL PERCENTILE	45.1	77.0 **
LANGUAGE DEVELOPMENT (SPELLING):		
GRADE EQUIVALENT	6.7	7.8
NATIONAL PERCENTILE	42.4	56.6
TOTAL GENERAL LANGUAGE DEVELOPMENT:		
GRADE EQUIVALENT	5.1	7.5 **
NATIONAL PERCENTILE	42.8	67.4 **
SILENT READING:		
VOCABULARY:		
GRADE EQUIVALENT	5.2	8.3 **
NATIONAL PERCENTILE	46.2	77.6 **
COMPREHENSION:		
GRADE EQUIVALENT	5.7	9.0 **
NATIONAL PERCENTILE	52.2	79.1 **
TOTAL:		
GRADE EQUIVALENT	5.5	8.6 **
NATIONAL PERCENTILE	49.5	79.7 **
GENERAL LANGUAGE ACHIEVEMENT:		
GRADE EQUIVALENT	10.5	16.2 **
NATIONAL PERCENTILE	92.3	147.1 **

** SIGNIFICANT AT .05 LEVEL.

TABLE 78

SUMMARY OF ANALYSIS OF VARIANCE OF THE GILMORE ORAL READING TEST

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP	
TOTAL ACCURACY			
STANINE	5.4	7.5	
GRADE EQUIVALENT	6.6	7.5	
PERFORMANCE RATING	2.3	2.7	
COMPREHENSION			
STANINE	6.4	7.3	
GRADE EQUIVALENT	7.3	7.9	
PERFORMANCE RATING	2.5	3.3	
RATE OF READING			
STANINE	1.4	2.2	**
RATE WORDS PER MINUTE			
RATE SCORE (WPM-SECONDS)	363.7	521.6	
PERFORMANCE RATING	2.2	3.0	**
TOTAL ORAL READING SKILLS			
STANINE	13.2	15.8	
GRADE EQUIVALENT	13.8	15.4	
PERFORMANCE RATING	7.0	8.9	**

** SIGNIFICANT AT .05 LEVEL.

TABLE 79

SUMMARY OF ANALYSIS OF VARIANCE OF THE RESULTS OF PICTURE STORY LANGUAGE

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP	
PRODUCTIVITY			
TOTAL WORDS			
AGE EQUIVALENTS	8.5	9.3	
PERCENTILE	23.6	22.0	
STANINE	3.3	3.3	
TOTAL SENTENCES			
AGE EQUIVALENTS	7.3	12.5	
PERCENTILE	25.0	37.2	
STANINE	3.5	4.5	
WORDS PER SENTENCE			
AGE EQUIVALENTS	10.6	11.5	
PERCENTILE	35.3	47.6	
STANINE	4.2	4.9	
SYNTAX QUOTIENT			
AGE EQUIVALENTS	10.7	16.2	**
PERCENTILE	34.5	59.4	**
STANINE	4.3	5.6	
ABSTRACT- CONCRETE:			
AGE EQUIVALENTS	12.7	12.9	
PERCENTILE	64.6	56.9	
STANINE	6.4	5.5	

** SIGNIFICANT AT .05 LEVEL.

TABLE 80

SUMMARY OF ANALYSIS OF VARIANCE OF THE ARTICULATION TEST RESULTS

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) EARLY ENTRANTS GROUP
SUBSTITUTION OF PHONEMES	2.1	0.7
DISTORTION OF PHONEMES	1.2	0.7
TOTAL ARTICULATORY ERRORS	3.4	1.4

** SIGNIFICANT AT .05 LEVEL.

TABLE 81

SUMMARY OF ANALYSIS OF VARIANCE OF THE RATINGS OF LANGUAGE AND SPEECH PERFORMANCE

VARIABLE	(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP	
TEACHERS' RATINGS:			
INFLECTION	* 3.0	1.8	*
GENERAL LANGUAGE DEVELOPMENT	* 3.3	2.0	**
JUDGES' RATINGS:			
INFLECTION	* 3.2	2.6	**
SCORE RANK (MEAN)	* 5.0	1.0	**

** SIGNIFICANT AT .05 LEVEL.

* RATING RANK ORDER 1.0 = HIGH 5.0 = LOW

TABLE 82

SUMMARY OF ANALYSIS OF VARIANCE OF THE ACCURACY OF VOWEL PRODUCTION

VARIABLE		(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP
VOWEL OR DIPHTHONG		*VOWEL PRODUCTION RATINGS	
1. / o /	(FOR:JOE)	3.00	2.99
2. / u /	(FOR:TOOK)	2.99	2.99
3. / ɑ /	(FOR:FATHERS)	2.99	2.98
4. / U /	(FOR:SHOE)	2.99	2.99
5. / ɛ /	(FOR:BENCH)	2.88	2.91
6. / aʊ /	(FOR:OUT)	2.98	2.98
7. / æ /	(FOR:AND)	2.95	2.93
8. / e·ɪ /	(FOR:LAID)	3.00	2.97
9. / ɪ /	(FOR:IT)	3.00	2.99
10. / ə /	(FOR:THE)	2.98	2.99
11. / ɔ /	(FOR:LAWN)	2.96	2.98
12. / ɚ /	(FOR:FATHERS)	2.99	2.98

* RATING RANGE

2.0=NOT ACCEPTABLE 2.5=UNDECIDED 3.0=ACCEPTABLE

** SIGNIFICANT AT .25 LEVEL

TABLE 83

SUMMARY OF THE SUBJECTS SELECTED FOR THE INVESTIGATION

	(E.E.) EARLY ENTRANTS GROUP	(L.E.) LATE ENTRANTS GROUP
NUMBER OF SUBJECTS	15	15
MALE	6	6
FEMALE	9	9
AGE OF SCHOOL ENTRY		
RANGE COMPUTED IN MONTHS	63 - 75	83 - 92
AGE AT TIME OF STUDY		
RANGE COMPUTED IN MONTHS	105 - 159	119 - 172
GRADE AT TIME OF STUDY		
FOURTH	6	6
FIFTH	1	1
SIXTH	0	0
SEVENTH	5	5
EIGHTH	3	3

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VITA

VITA

Robert Guy Hyder was born in the "Volunteer" state of Tennessee in the city of Elizabethton where he received his public school elementary and secondary education. His under-graduate work was taken at the University of Chattanooga, and Southern Missionary College, Collegedale, Tennessee. He received the degree of Bachelor of Arts at Southern Missionary College, June 5, 1949. His graduate educational work was done at Potomac University, Washington, D.C. (now called Andrews University, and moved to Berrien Springs, Michigan); American University, and George Washington University in Washington, D.C.; University of Colorado, Boulder, Colorado; University of California, Berkeley; D.C. Columbia Teachers College, Washington, D.C.; George Peabody College for Teachers, Nashville, Tennessee; University of Maryland, College Park, Maryland; California State University at Los Angeles. He received the degree of Master of Arts at California State University at Los Angeles, June 18, 1966. His current graduate education at Walden University as a Doctoral Fellow has been in Early Childhood Education in the fields of speech and language.

Upon graduation from Southern Missionary College, Mr. Hydur accepted a position as youth Christian education and missionary volunteer professional worker for the Georgia Cumberland Conference of the Seventh-day Adventist Churches, Atlanta, Georgia, where he served for more than a year. After this period of professional experience, he took a leave of absence for further graduate study. Other professional educational experience includes: service as a Speech Pathologist and Audiologist for school districts in Washington, D.C., Tennessee, and California for the past twenty years (1955-1976). Other educational experience includes: elementary school principal, consultant for education of orthopedically handicapped pupils for the County of Carter Superintendent of Schools Office, Elizabethton, Tennessee; and teacher and counselor in Hayward Union High School District, Hayward, California and in Skagway Public Schools, Skagway, Alaska. Currently he is serving as Specialist in the Speech and Language Section under the direction of the Assistant Superintendent in the Division of Special Education for diagnosis, placement and management of pupils for the home-based program for pre-school speech impaired children for the Los Angeles Unified School District, Los Angeles, California.

In civic and community endeavors, Mr. Hyder for many years has served as layman in the highest position in his Seventh-day Adventist Church as an elder. As a member of the Sons of the Revolution in the state of California, he is serving as a participant in plans for the "Bicentennial Celebration of the United States of America."

Mr. Hyder's dissertation in the growing field of higher education's emphasis upon early childhood education has incorporated changes in educational practice decreed by the controversy created by learned societies and scholars, such as Dr. Raymond S. Moore. After conferences with Dr. Moore, Mr. Hyder selected his topic along this theme.

As an adjunctive plase of the present research investigation, Mr. Hyder authored and successfully submitted a proposal to the California State Department of Education (EHA Title VI-B) in 1975, for the project component: Home-Centered Program for Speech/Language Impaired

Pre-School Children, now in operation in the Los Angeles Unified School District.